ELECTRIC RAILWAY JOURNAL

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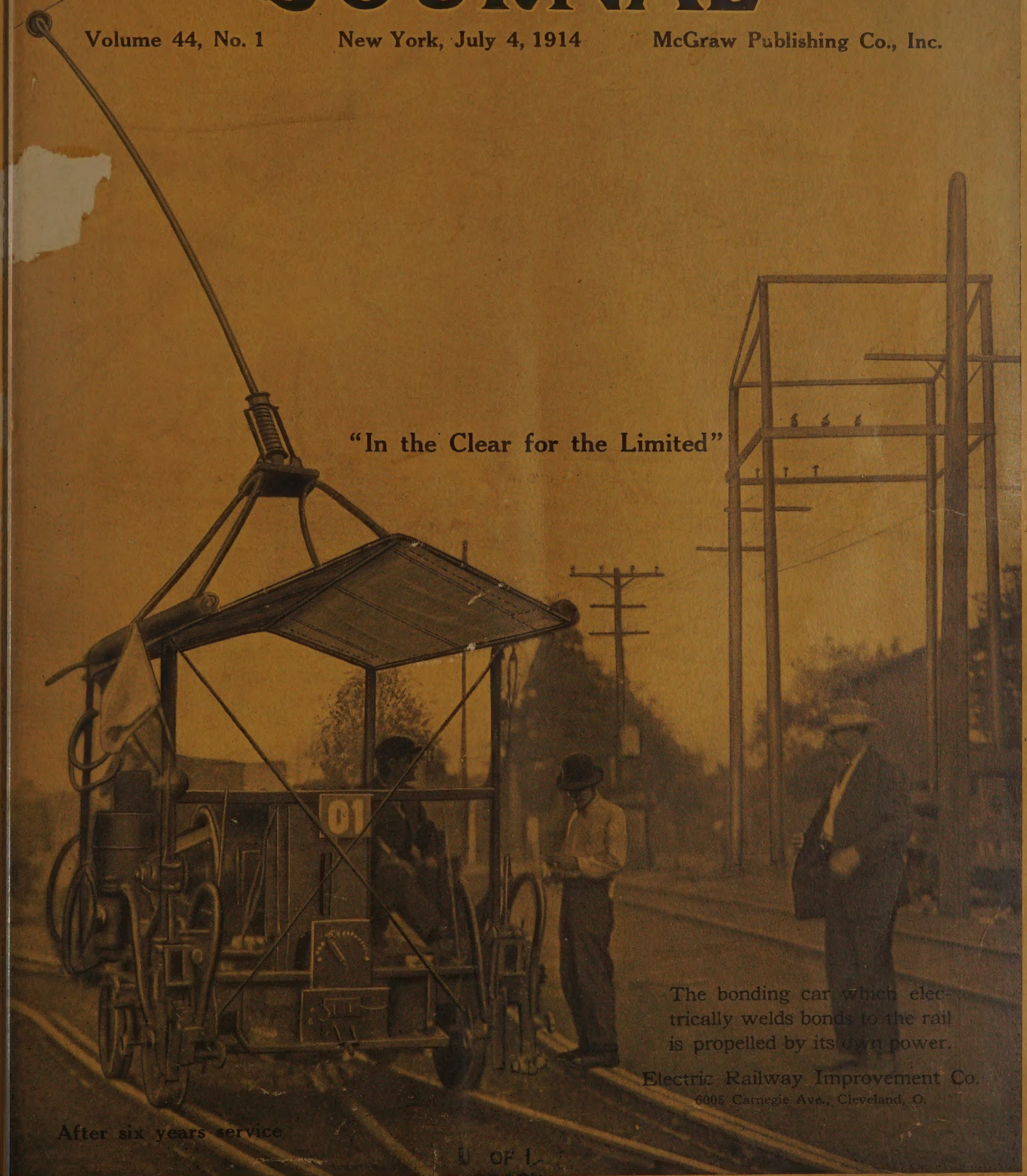

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Electric Railway Journal

New York, July 4, 1914

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Pumps

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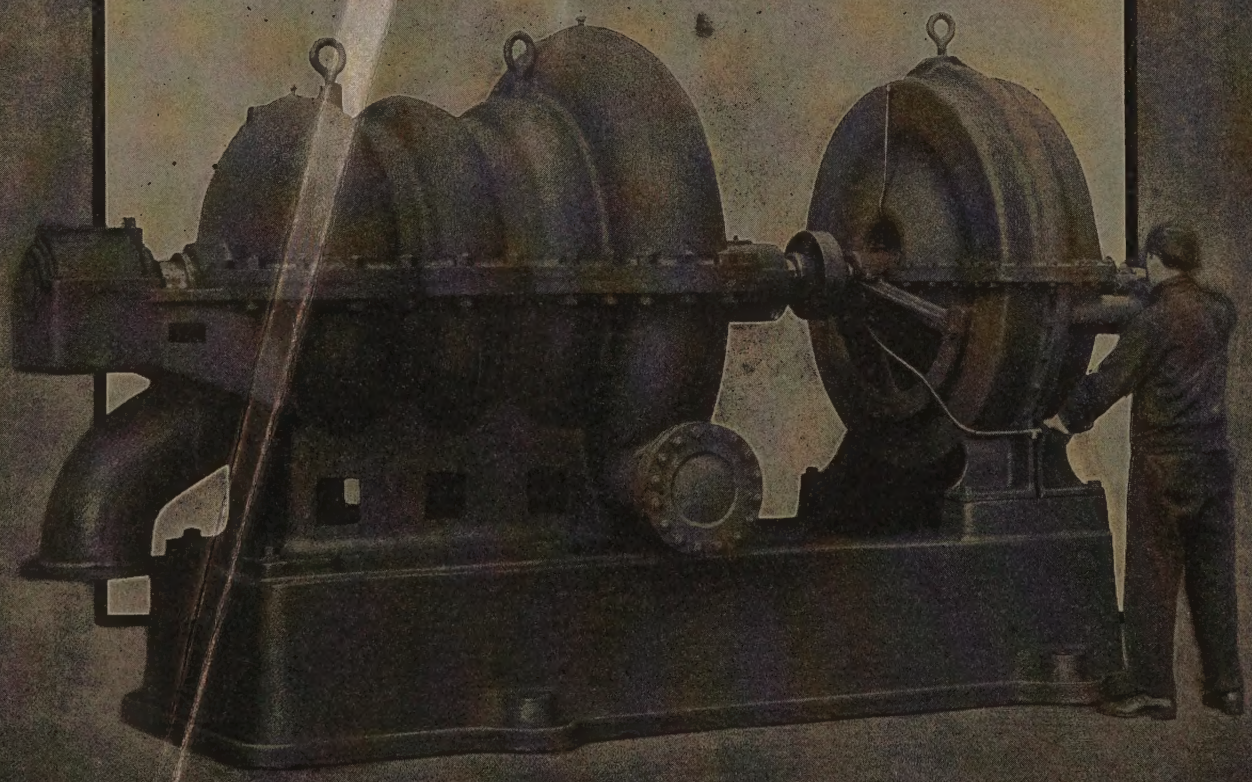

Electric Railway Journal

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Consolidation of Street Railway Journal and Electric Railway Review

Vol. XLIV NEW YORK, SATURDAY, JULY 4, 1914 No. 1

MR. WESTON AND POLITICS

The forcible removal of George Weston as a member of the Board of Supervising Engineers, Chicago Traction, is, of course, due wholly to politics. The Board of Supervising Engineers is peculiarly a creation of the city of Chicago. It was formed under the ordinances of 1907 to give the city a regulative hand in the rehabilitation of the surface railway properties and over subsequent capital expenditures. The city wanted the board to do exactly what was done and had its way. That, so far as the board had authority, it has failed to do its work well in these respects is not, we believe, seriously claimed by anyone. The city undoubtedly made a mistake from its standpoint when it failed to write into the ordinances authority for the board to regulate service and other features of the operations and affairs of the companies. However, the fact that it did not do so when it had an opportunity cannot be laid to the door of the members of the board nor to Mr. Weston. The cause for the removal of Mr. Weston is to be found in that kind of politics which threatens disaster to all forms of regulation and supervision in this country. Such a happening naturally provokes a query concerning public ownership. If politics can determine so absolutely the disposition of a satisfactory member of a regulative body, would any less drastic step be taken where a property was not simply regulated by the public but actually operated by the public? The event is an illustration of the extreme difficulty of combining politics and the direction of public utilities. Fortunately, Mr. Weston is still chief engineer of the board.

EFFICIENCY OF CO-OPERATION

In a paper which was read at this week's convention of the New York Electric Railway Association and is published in abstract elsewhere, W. H. Sawyer has emphasized the practical, common-sense side of efficiency. This treatment of the subject is timely. So much has been heard of late about the wondrous possibilities of "efficiency engineering," and so little has actually been accomplished in the way of final results, that even the sound of the name has, to many employers, acquired in mild degree the qualities of an emetic. In calling attention to the fact that efficiency may be reached through co-operation Mr. Sawyer makes an exceptionally important point. Through reasonable co-operation the operators in any industry may obtain the benefit of the costly experience that only the strongest companies can afford to purchase at first hand, yet but few of the smaller concerns take advantage of it. Each year the committees of the various technical associations present reports fairly teeming with valuable information on actual practical problems, but it is safe to say that they are not read understandingly from cover to cover by more than 10 per cent of the individual members. Certainly many of the suggestions contained in such reports are seldom put into practice, and whether this condition arises through lack of appreciation of the efficiency of co-operation or whether it is due to simple inertia the fact is obvious that so long as it continues the field of endeavor of even the most impractical reformers will be a wide one.

PRACTICE OF PUBLIC RELATIONS

"I propose hereafter to stand up and be counted and let the people of any community in which I am interested know just what they are doing not only to me but to themselves." These were the words recently spoken by Thomas N. McCarter in an open meeting before the citizens of Toledo, and we wish that there were more men in the electric railway field who would feel such a steadfast resolution. There is something stirring in the thought that the president of one of the largest public utility corporations in the country can lay aside his own pressing affairs and journey westward to point with the finger of experience and wisdom to the dangers in the present Toledo situation. We do not know that the facts presented by Mr. McCarter are entirely new to the citizens of Toledo. Probably the same information has been reiterated again and again in the recent publicity campaign, but this very repetition by local officials has rendered it less forcible than the words of the visiting authority. Mr. McCarter's review of the three points of fare, franchise and municipal ownership is clear-cut and persuasive, but it carries more weight because it is placed side by side with the recital of the Toledo dispute and because it gives a running story of the more sane treatment accorded his own company in New Jersey. Mr. McCarter is optimistic and says that he believes the day is coming when electric railway properties will be recognized on a higher plane than they have been in the immediate past. It is quite certain that this optimism would not be unwarranted if all electric railway officials would personally put into practice all that has been said on the subject of public relations with as much zeal and as great a spirit of personal sacrifice as Mr. McCarter has done.

THE ALL-AROUND SIDE-ENTRANCE TYPE OF CAR

A feature in the growing popularity of the side-entrance type steel girder car is its equal availability for the opposing conditions of city and interurban service. In city operation it is often necessary to have the greatest possible capacity for a given length, and this feature the side-entrance car gives in the elimination of wasteful platforms and in the greater car length which is made possible by the use of rounded ends. The low step and the desirable isolation of the motorman also commend themselves as valuable features. For interurban operation the factors of greatest capacity, maximum possible length and low step are not of commanding importance, although the tapering ends may be considered as of some benefit in reducing energy consumption. The big problem in the case of the interurban car is the location of the smoking compartment, for it is most objectionable to women and children to pass through this compartment even when it is unoccupied. The side-door car offers a happy solution, whether single or double-end operation is in vogue, because the smoking section can be provided with a separate passageway and partition doors. This consideration may seem a small one to some operators, but it was the prime reason for adopting a side-entrance car on an interurban railway which feels sure that this change will cause a large increase in mid-day traffic because "A ride will then become a part of the day's entertainment," as the manager expressed himself in regard to the change.

DOUBLE-PINION DRIVES FOR RAILWAY MOTORS

Elsewhere in this issue is an article by A. A. Blackburn, chief engineer Belfast (Ireland) City Tramways, outlining the experience of that street railway with the double-pinion drive, in which a pinion is pressed on to each of the extended ends of the armature shaft to mesh with two gears that are mounted on the axle just inside of either wheel. The direct mechanical advantages of such an arrangement are so obvious that they have often attracted consideration to the scheme, although no practical use of it seems ever to have been made in this country for street railway service. That it should first appear in extensive use in Ireland, whence came the once-famous Irish "bulls," does not by any means require that it should not be taken seriously, even though a well-known Irish engineer has said, regarding the use of two pinions, that he would rather have one boil than two boils under any circumstances which occur to him.

Indeed, it should be noted that, in addition to its obvious "squaring" effect, the scheme provides a means for eliminating several of the worst difficulties encountered with the present standard single-pinion drive. First of these in importance is the fact that the slightest wear on armature shaft or axle bearings allows the pinion and gear to separate slightly, throwing the armature shaft out of line with the axle and placing the entire strain of driving upon the inside corners of the pinion teeth. This, as is well known, results in the almost invariable breakage of teeth at the corners nearest to the motor, and, notwithstanding the extraordinarily high grades of material used for gear teeth and the conservative standard diametral pitch of three teeth per inch, difficulty is often experienced in reducing the number of pinion teeth below fifteen, although the theoretical lower limit is twelve.

As the gear diameter is naturally limited by the diameter of the car wheel, the paradoxical condition has been reached wherein the smaller sizes of railway motors actually have a slower armature speed than the larger ones. Obviously a high armature speed will reduce the weight of a motor of given horse-power in almost inverse proportion, and to a marked extent it will reduce the cost as well, so that any arrangement whereby the pinion can be reduced in size and the armature speed increased seems to be well worth a thorough tryout.

The plan of using double pinions does just this. By maintaining the teeth in line it eliminates the improper strains on the corners of the teeth, and by dividing the work it cuts in half the power transmitted by each pinion. With its use, therefore, a great increase in gear ratio becomes possible, not only by reducing the pitch and adding teeth to the gear without increasing its diameter, but possibly also by reducing the number of teeth on the pinion, and, as a consequence, the armatures of motors for city service could be speeded up materially. The equivalent of the present 30-hp motor, for example, could easily be made to give an output of 45 hp. Certainly the consequent reduction of weight and first cost would at least go a long way toward offsetting the disadvantages of the necessary extra parts, and in view of the fact that the double-pinion drive has had its practicability demonstrated not only by the Belfast installation but also by a number of American electric locomotives so equipped it looks like a means for economy that is too important to be passed by without trial.

The questions of adjustment of teeth and of providing sufficient clearance between the wheels have no doubt contributed to the general timidity with which the use of the double-pinion drive has been regarded. However, the first of these seems to have been satisfactorily met by the experience in Belfast and the second may be answered by the fact that, even when new, two pinions with 2½-in. faces would provide the equivalent of a single one with the present standard 5-in. face. When wear has taken place in the bearings and the load on the single pinion has been concentrated on the inner corners of the teeth, the two narrow pinions would provide a vastly greater effective face.

Of course, the arguments that apply in favor of the double-pinion drive in city service do not have equal weight in the case of interurban cars, which have a high free-running speed and a gear ratio well inside of the maximum set by space limitation. However, the squaring effect of the double pinions still remains and reduction in pinion trouble is inevitable, even with this class of service.

A BROAD VIEW OF COMMISSION RESPONSIBILITIES

In the early days of commission rule there was a general sentiment on the part of public utility companies that the powers conferred upon state regulating commissions would be used primarily for the imposition on the companies of greater burdens than they had hitherto been required to carry. Nor was this opinion confined in its entirety to the companies. In fact, we suspect that one of the principal reasons why many citizens advocated commission regulation was that they believed it would have the effect of reducing fares and increasing the service of the public utilities.

With the extension of the plan of commission government and its more nearly perfected operation, however, a better conception of the functions and opportunities of public service commissions has been developed. In many respects a commission is a judicial tribunal. It considers evidence and renders decisions upon its best analysis of the facts presented. But a board of commissioners has other and broader duties than those simply of a judicial character. It has executive powers, as well as judicial functions, and for this reason possesses a wider latitude in its decisions than a court, because the attitude of the latter must be one of strict interpretation of existing statutes and of the constitution, whereas by the statutes the commission is able to interpret its powers in the way it deems best for the community.

An example of this enlightened view of the purposes of a commission is shown in the decision of the Public Service Commission for the Second District of New York in a recent case of the County Council of the city of Schenectady against the Schenectady Railway. The aspect to which we refer is exhibited not so much in the conclusion announced by the commission as in the reasoning by which it reached this decision as expressed in the opinion of Commissioner Emmet.

The case came before the commission because the Schenectady Railway some time ago discontinued its practice of selling six tickets for 25 cents and established a standard 5-cent rate of fare. The usual steps were then followed of a complaint by the authorities of Schenectady and a valuation of the property to determine whether the company was earning a reasonable return at its old rate of fare. The valuation of the railway property as claimed by the company was $4,562,032 and the value as determined by the city was $3,157,809. The net profits after the annual deductions for betterments, additions, etc., amounted to about 3 per cent on the investment as determined by the company's valuation. Without these deductions, it amounted to between 8 and 9 per cent on the valuation made by the city, or with these deductions, a return considerably lower.

With these facts before it the commission justifies the higher rate and it does so not because it would not be possible for the company to keep out of a receivership at the lower rate but on the broad ground of public policy. "Our present public service commissions law was intended," the commission says, "not merely to permit corporations of this character to accumulate such scant earnings as would keep them out of the bankruptcy courts, but actually to allow them under good management to attain positions of reasonably assured prosperity. The fact, therefore, that the Schenectady Railway seems to have attained that kind of a position does not alter our opinion that such a decision as is asked for by the complainants here would be regarded throughout the State of New York, and perhaps over a larger area, as the equivalent of a warning to private enterprise and capital that these are not particularly wanted any longer in the street railway field. We do not think it well to issue such a warning, or what might with some degree of justice be construed as such, at the present time. The result of driving private capital from the work of extending and improving the transit facilities our people now enjoy would, in our opinion, be quite as deplorable from the standpoint of the general public as from that of the financially courageous individuals whose money is now invested in good faith in public service enterprises throughout the United States."

These words are refreshing. There was no need for the company to cite as a defense that a lower fare would result in the confiscation of its properties. Under the federal constitution the company is protected against the actual taking away of its property, but public policy demands more than this. As Commissioner Emmett says later in his decision: "The truth is, it is not a particularly happy time, in our judgment, for government to intervene with a heavy hand in cases like this, where the rate that is complained of is after all merely the well-known and widely prevalent charge of 5 cents for each passenger. If industrial conditions in Schenectady and elsewhere were different, if the business outlook were rosier and the difficulties in the way of an orderly adjustment of our commercial problems less complex, we might (although of this we are by no means sure) be willing to apply in this particular case a somewhat more rigorous test as to the justice of the rates involved than we are now applying. But the conditions to which we refer seem to justify us in construing an admittedly doubtful point with some degree of liberality toward the respondents in this case, leaving the way open at some future time, after a change in conditions has occurred, to consider afresh the fundamental question involved in this controversy, if by that time voluntary action has not been taken by the railway company to adjust its differences with the citizens of Schenectady on some basis that will be satisfactory to both parties."

We have had occasion in the past to comment favorably upon the decisions of the Public Service Commission of New York, Second District. Although with a changed personnel, the commission is maintaining its reputation for forceful and sound thinking for the benefit of the community, while holding level the scales of justice.

THE PSYCHOLOGY OF BUSINESS

A great deal has been said in high political circles recently about the trouble with business at present being largely psychological. Psychology has been defined as the study of the condition and phenomena of the mind, and if business and public utility companies are suffering from psychological conditions it is because the men interested in those activities have become discouraged in their outlook for relief from the conditions under which they have been and are suffering. Instead, they see evidences everywhere of a tendency in legislation to put in force untried theories of government and to disregard the experience of the past in political matters, as well as the fundamental laws of finance and business. The result is a general feeling of uncertainty and dread, which is not confined to those who are so bound to old forms and methods that they cannot see anything good in anything new but is shared by a very large part of the business world. As an example of the loose political thinking and the disregard of the warnings of the past which seem to characterize some of the political policies at the present time, we need only cite the movement in some parts of the country in favor of municipal ownership of public utilities, and even the venture of some cities in enterprises of this kind.

In a recent talk, in which he discussed this situation, F. A. Vanderlip, president of the National City Bank of New York, referred to this restlessness and desire to try all kinds of freak experiments in governmental matters and said that they result in as startling productions, viewed in the light of anything known before, as had been reached in art by the schools of cubism and futurism. He also said that he had evidence to indicate that the majority of the people of the country were not behind Congress in demanding the enactment of the further business legislation now proposed, and even that a majority of Congress itself is unfavorable to the passage of many of the present measures which have aroused the opposition of business men. His recommendation was a Congressional recess of three months to give the country a rest and to permit the members of Congress to familiarize themselves with the views of their constituents and the state of public opinion. He also recommended greater interest on the part of the business men of the country in political matters and insisted that it was their duty to assist the public to obtain clearer ideas of correct business principles.

This latter suggestion is one which ought to be followed both during a Congressional recess and at other times in the public utility field as well as in that of general business. Electric railway managers ought to know the facts about their own industry and should be equally ready to give expression to them. We are firmly convinced of the possibility of better public relations as a result of better knowledge of railway problems by the public and through this means of a better treatment of the capital invested in public utility enterprises, but we are also equally convinced that such a result will not be brought about unless electric railway officials and others whose interests are concerned with these companies assume the major part of the burden of education. Both as individuals and collectively they should improve every opportunity to give the facts and to correct every misrepresentation so effectively and speedily that the truth will surely overtake the lie. This policy, if followed consistently, will win.

FUNDAMENTALS OF "SAFETY FIRST"

The excellent and successful efforts to reduce street accidents under the "safety first" propaganda, made largely at the instigation of electric railway managements, depend for their effectiveness upon the recognition and application of certain fundamental principles. The most vital of these is that ultimately the safety of the individual depends upon the degree to which he concentrates his attention upon his own safety. When a foot passenger is on his way through the streets, his primary business is that of transportation. His duty is to get somewhere in reasonable time and with minimum danger to life and limb. His mind should be intent on this purpose only. Hence those methods of educational work which are designed to impress upon young and old the importance of mental concentration in dangerous locations are striking at the root of the matter. Detailed suggestions, which drive home the lessons of previous accidents, will serve to make the teaching permanent. Heedlessness, absent-mindedness, lack of concentration, these are the causes of most accidents. We believe that only a comparatively few result from bewilderment in the face of danger, or, in other words, that the number which could not have been prevented by care on the part of pedestrian or passenger is very small.

An electric railway company naturally has every incentive to keep down the number of street accidents, and it is eminently proper that its officers should be active in any safety propaganda which is begun in the city in which it is located. But, after all, "safety first" has a far broader significance than merely that of reducing the accident account of the local electric railway company. The community as a whole has a far greater interest at stake and should, in proportion, show a far greater concern in the plan. An important matter of this kind should not be left to depend upon the enterprise and humanity of a single interest only. "Safety first" should be taught continuously, and it is a fit subject for instruction in the home, the school, the church. Herbert Spencer gives as the first aim of education training for self-support. A still more fundamental purpose in the busy community of the present day is that of self-preservation as exemplified in the care and ability of the individual to avoid unnecessary danger. When this duty is realized the question will no longer be asked as to who will continue the "safety first" campaigns which have been inaugurated so successfully and largely through the efforts of electric railway companies in different cities during the past two years. They will be conducted by the public as a part of its most essential work.

WORKMEN'S COMPENSATION LEGISLATION

The addresses that were delivered this week at Bluff Point before the New York Electric Railway Association on the subject of employees' accident insurance, while dealing more particularly with the New York State workmen's compensation law, which went into effect on July 1, should be of interest to all electric railways wherever situated, for they lay stress upon the tendency for the betterment of working and social conditions that have not yet reached their fruition among our American states. During the last few years industrial insurance and workmen's compensation laws creating new and fundamental principles of compensating workmen for injuries received in the course of their daily employment have been enacted by the United States and by twenty-two individual states.

When the American colonies separated from Great Britain, they inherited the common law under which the master was liable to his servant for damages in case of accident only when the accident was caused by the fault of the master or by a vice-principal, or agent acting for the master. Under the common law the master was entitled to three defenses: The fellow-servant doctrine, assumption of risk and contributory negligence. Such a plan was well adapted to a state of society in which the establishments of employers were comparatively small and where both the employer and employee could oversee and to a considerable extent could control the conditions of work. In other words, it was suited for a social system under which, as a rule, each employee could know his employer and most of his fellow employees, because, then, if he did not like either, he could change his job. But these defenses, especially that of the fellow servant, lost their significance when large industrial plants came into being, because then a workman might have many thousands of fellow servants whose actions he could not control and of whose existence he was in most part ignorant.

Estimates of the cost to the employer of the workingmen's compensation plan vary enormously, and it has been put as less than the present plan and also as much more. Two estimated figures quoted at the Bluff Point meeting were one half of 1 per cent of the gross receipts in the case of a manufacturer and 20 per cent of the net receipts in the case of a steam railroad. Mr. Sims, who mentioned the latter figure, also called attention to the fact that if the expense was greater than that under the present system the railroad companies could not pass this charge on to be paid by the consumer, the plan usually suggested with laws of this kind. Definite figures of the expense will not be forthcoming, of course, until the present law has been in general use for a considerable time. We believe that most railways will admit the desirability of the principle of workmen's compensation laws and will agree that their advantages are not confined entirely to the workman. Such laws are certainly in line with the spirit of the times, but if they cast an additional financial burden on the railways some means must be devised to allow these companies to shift this burden upon the riding public. Moreover, if the incidence of the compensation expenses as between the several classes of employers proves unfair to the common carriers, adjustments will have to be made to bring about a distribution which is more equitable to the carriers.

THE USES OF A TECHNICAL JOURNAL

The careful reader of a technical magazine is usually conscious of two mental experiences. He will usually notice, first, that he is acquiring information of direct use to him in his vocation and, second, that his mind has been opened to larger questions of economics and public policy, to events and experiences which affect him only indirectly. For example, here is a man who inspects car equipments for a livelihood. He is really two beings in one. As an inspector he is interested in wiring, motors, controllers and other elements of his trade. As a man he wants to know what is going on in the world around him. If he does not have this desire for a wider experience he is only an inspector, and a poor one at that.

The attention of the average reader is naturally directed first to that part of the paper which contains matter affecting him most directly, but it does not stop there. Such topics as the clamor for the electrification of steam railroads, the experiments in municipal ownership of public utilities and the tendency to more and more elaborate regulation of public utilities are of interest to the man in the pit as well as to those who occupy directors' chairs. They may not intimately concern his daily life, but neither does the war in Mexico, yet he undoubtedly follows the accounts of that in his daily paper so that he will keep informed of current events and be able to talk intelligently about them with those with whom he comes in contact. The old saying that "reading maketh a full man" was formulated long before the days of technical journalism, but it is vitally true in the industrial world of to-day. The keen, up-to-date, rising man is almost invariably a discriminating reader, broad in his selection of topics. For this reason each number of a modern journal is planned so that, as far as possible, all sections will have some value to every reader.

The editor of the technical paper wants to print facts which will help each of his readers to earn a better living and to earn it more easily. But he considers that this is far from their sole desire. He feels that while each reader is particularly interested in certain parts of the paper and in certain departments of the industry, all of his readers are broadly interested in all parts of the paper and that by keeping in touch through it with the advancement in the field they are better fitting themselves for their present work as well as for any which the future may bring to them in the form of greater responsibilities. Finally the editor also feels that it is his duty to endeavor to discern the signs of the times in the different branches of the industry, to interpret them accurately and to express them in terms of his reader's interests. These, in the main, are the functions of a technical journal.

A 151-Mile, 1200-Volt Line in Texas

This Catenary Line Gives High-Speed Service Between Dallas, Waco, Corsicana and Other Important Cities in a Rich Cotton Country—Three of the Seven Substations Have Three-Piece Motor-Generator Sets for Delivery of 600-Volt and 1200-Volt Current

Another long link in the chain of electric interurban railways radiating from Dallas, Tex., has been completed. This new line was built by the Southern Traction Company and forms a 151-mile extension to the Texas Traction Company's lines, making in all an electric railway system of approximately 250 miles. This is by far the longest electric line in Texas and it is also the longest one in the South.

Interurban railway construction in Texas began in 1900 with a 10½-mile line between Denison and Sherman. This was followed two years later by a 35-mile line between Dallas and Fort Worth, built by the Stone & Webster Management Association. The first interurban construction on a large scale, however, was started by the Texas Traction Company in 1906 when it began the laying of a 76-mile line between Dallas and Sherman.

During 1911 and 1912 the success of the first installations led to the construction of more than 230 miles of electric lines in the State, which included the Galveston-Houston Electric Railway, 50 miles long, and the Fort Worth Southern Traction Company, 32 miles long, both of which were started in 1911. In the following year the Southern Traction Company financed and commenced building its 151-mile extension, which was completed and put in operation in January, 1914.

THE ROUTE

This new 1200-volt line of the Southern Traction Company is made up of two sections, one extending from Dallas to Waco, 97.1 miles in length, and another from Dallas to Corsicana, a distance of 54 miles. Both of these divisions, along with the original line between Dallas and Sherman, Tex., traverse the heart of the great Black Land belt. This is the most densely populated and highly productive section of Texas. Within recent years Dallas has become the metropolis of the Southwest, being a railroad and business center as well as a distributing point for manufacturers' equipment and supplies for Texas and the extreme Southwest of the United States. Moreover, added impetus has been given to business prosperity in Texas by the approaching completion of the Panama Canal. With this in sight, many railroads have improved their terminals and bettered their roadbeds in order to facilitate the movement of freight to the Galveston seaboard.

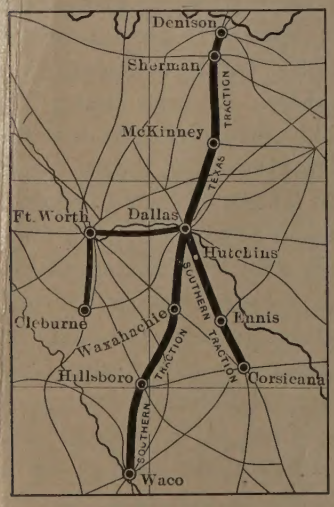
A natural channel of travel exists between Dallas, Waxahachie, Hillsboro and Waco, as well as between Dallas and Corsicana, each being the county seat of a rich cotton-producing territory. In fact, Waxahachie is said to be the largest inland cotton market in the world. Taking advantage of this condition, as well as the infrequent service furnished by steam roads between the points named, the Southern Traction Company was financed locally and undertook the construction of the new electric lines.

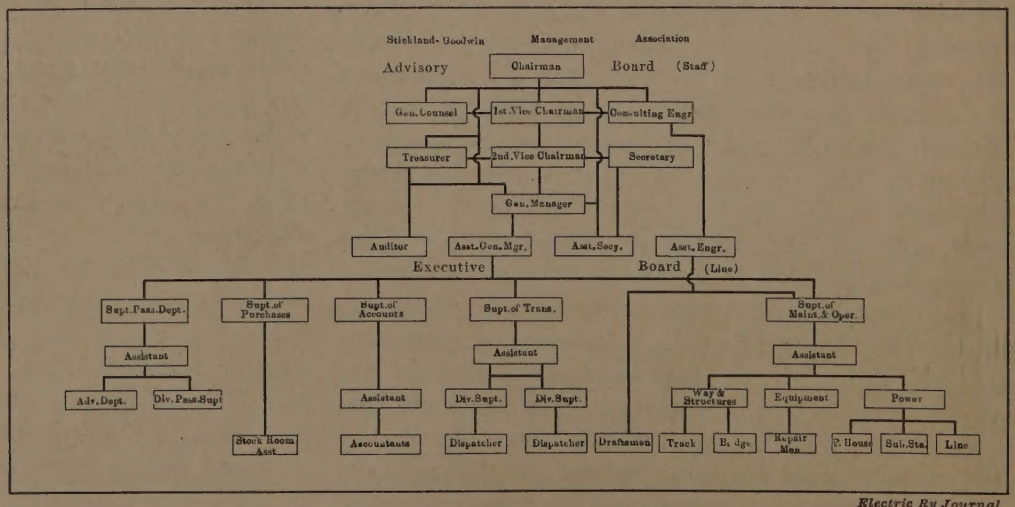
Another feature which helps to make electric interurban railway construction and operation profitable in Texas is the fact that the legal fare is 3 cents per mile. In addition, interurban lines do not carry bulk freight, but engage in an extensive first and second-class express business with rates fixed a little less than those charged by old-line express companies. Earnings which would be considered phenomenal in other parts of the United States are obtained by Texas electric railways. Few of them earn less than 40 cents per car-mile, with an hourly passenger service and at least two or three express trains each way daily.

Summer in Texas lasts approximately ten months of the year, during which period people travel by the electric line almost exclusively in order to be free from the dirt and dust incident to steam railroad travel. This tendency has been clearly demonstrated on the line between Dallas and Fort Worth, where a steam railroad between the same points proceeded to give very frequent service at rates far below the least the electric lines could afford to charge. Despite this the travel between these two cities went the electric way almost exclusively, and in time the steam railroad had to abandon its local competitive service.

CONSTRUCTION FEATURES

Topographical conditions in the territory traversed were not ideal for the construction of a first-class interurban railway at least cost for grading, while the undulating black earth and clay hills made the grading quantities per mile quite heavy. However, these cuts and fills through the gently rolling, highly productive





Electric Ry Journal

SOUTHERN TRACTION—CHART OF CONSOLIDATED MANAGEMENT SOUTHERN & TEXAS TRACTION COMPANIES

SOUTHERN TRACTION—CEDAR CREEK BALLAST DECK VIADUCT NEAR DALLAS

SOUTHERN TRACTION—BRAZOS RIVER BRIDGE

agricultural country made the new interurban line an interesting and picturesque one to the traveler. On the other hand, profiting by experience in electric railway construction since 1900, the Southern Traction Company provided a high-speed roadbed with a maximum grade of 2 per cent outside of the city streets and a maximum curvature of 6 deg. except where governed by streets. Of the total mileage built 91½ per cent is tangent track.

A private right-of-way varying in width from 80 ft. to 100 ft., depending upon the amount necessary to complete the grading economically, was purchased outside the cities. Additional widths were acquired at points where station sites were desired, or to provide sidings. This right-of-way is inclosed with a five-wire Osage-orange post fence with wing fences and cattle guards at all highway crossings. The standard roadway section is 16-ft. wide on embankments and 24 ft. in cuts, with a liberal allowance for shrinkage so that the seasoned embankment will remain full width. On embankments the slope is 1½ to 1, and in excavation it varies from ¼ to 1 to 1 to 1, depending upon soil conditions. The highest fill is at a point near Dallas over a 15-ft. concrete arch culvert, where the top embankment is 65 ft. above the floor of the culvert.

As mentioned heretofore, this extension comprises 151 miles of main line track, 20 miles of which, namely, between Dallas and Waxahachie, was acquired from the Stone & Webster Management Association. In addition, the completed line includes about 2 miles of second track and approximately 5 miles of sidings. The standard type of construction of all these tracks includes 6-in. x 8-in. x 8-ft. seasoned white oak ties, spaced seventeen ties to a 33-ft. rail. The ties were laid on 6 in. of gravel ballast except in paved streets, where 6 in. of concrete was placed under the ties. All gravel was taken from the railway's pits at Waco and Hutchins. Approximately 80 miles of the main-line track was built with 80-lb. A. S. C. E. rail and the remainder, except 5 miles in city streets, was built of 70-lb. A. S. C. E. rail. All turnouts from the main track are No. 9, with a 77.5-ft. lead laid on white oak switch ties cut to length, and equipped with medium height Buda switch stands. Practically all sidings were constructed with stub-ends; when the subgrade has thoroughly seasoned they will be double-ended.

BRIDGES AND STRUCTURES

In all, the construction of this new line comprises eighteen steel bridges or steel viaducts having a total length of 3513 ft. The longest single span was placed over the Brazos River at Waco, being 450 ft. in length and forming three 150-ft. spans. The longest viaduct, 1454 ft., was built at a grade separation which carries the interurban line over the main line and side tracks of two steam railroads at Waxahachie. All steel bridges and viaducts were designed to carry Cooper's E-30 loading. Probably the most interesting piece of bridge construction was encountered in building the

SOUTHERN TRACTION—VIADUCT AT WAXAHACHIE

SOUTHERN TRACTION—INTERIOR OF PASSENGER MOTOR CAR

piers for the Brazos River bridge. At this point caissons were necessary to carry on the pier excavation. These were constructed of reinforced concrete with 12-in. walls, beveled at the bottom to form a cutting edge so that they would settle readily as the excavation progressed. The complete reinforced-concrete caissons were about 16 ft. in height, extending from bedrock to the bed of the river. In order to conduct the excavating to advantage, however, the caissons were built in several sections. When bedrock was reached the bottom was sealed, after which the open caisson was used as a form for the concrete piers.

Concrete structures included two reinforced-concrete ballast-rock trestles, one 660 ft. long and another 340 ft. long. Both of these structures were required just south of Dallas, and are combination reinforced-concrete, deck-girder, ballast-deck structures, the former structure, however, supported on concrete piers and the latter structure supported on two-column bents and four-column towers alternately spaced along the length of the structure. A number of other waterways were provided with concrete arches, two of which are noteworthy, one being a 50-ft. reinforced-concrete arch and the other a 40-ft. arch. All reinforced-concrete structures were designed for Cooper's E-40 loading.

In several instances the size of the opening was questionable, and rather than run any risk of future renewals by building permanent structures, wooden-pile trestles were provided. These, it was believed, would give sufficient life to enable the engineers to study conditions accurately and replace them with permanent structures when renewals were necessary. In fact, the size of these trestle openings were severely tested during the record floods in December, 1913. All trestles withstood these floods without damage, and in each instance it was demonstrated that the large temporary openings provided were necessary. In all, 11,147 ft., or 2.1 miles, of wooden-pile trestle were constructed on this new line. Small openings, namely, those between 12 in. and 48 in. in size, were supplied by non-corrosive corrugated culverts.

At three points where steam railroads were crossed, topographical conditions were such as to make grade separation exceedingly expensive. At these points the crossings were installed at grade and were protected by derails on each side of the steam railroad. The derails are operated by an interlocking device designed so that the conductor may readily close them. The locking-bed elements, however, are so arranged that the derail cannot be closed until after the danger signals have been set on the steam line, and these signals cannot be dropped to the danger position if a train is within 2000 ft. of the crossing. This locking feature is controlled by a clock set for a thirty second release.

ENERGY GENERATION AND DISTRIBUTION

Energy for this new line is supplied at 2300 volts, sixty cycles by the Texas Power & Light Company, an organization controlled by the same holding company as the one which operates the interurban line. At present this energy is transmitted from the power and light company's Fort Worth station, but the larger portion of this load will ultimately be transferred to a new generating station now under construction at Waco. Energy is transmitted to six substations, including three terminal and three intermediate stations, located in the principal cities on the two divisions of the road. Each substation feeds a trolley section slightly in excess of 25 miles in length.

The three terminal substations are situated at Mon-

SOUTHERN TRACTION—PASSENGER MOTOR CAR WITH TRAILER

SOUTHERN TRACTION—WORK CAR

roe, a suburb of Dallas, Corsicana and Waco. Each is equipped with two 400-kw motor-generator three-piece sets, designed to deliver both 600 volts and 1200 volts d.c. to the trolley line, the lower voltage being necessary to comply with the ordinances of Dallas, Corsicana and Waco.

The three intermediate substations are located at Waxahachie, Hillsboro and Ennis. Each has one 400-kw motor-generator two-piece set, designed to deliver only 1200 volts d.c. In addition to the three intermediate substations, a portable substation has been purchased for use in cases of emergency.

As shown in one of the accompanying illustrations, the substations are housed in fireproof brick and concrete buildings, 40 ft. x 50 ft. in plan, with a clear inside height of 15 ft. The transmission lines enter the substation by way of a structural-steel terminal tower formed of four built-up tower posts which support the terminal insulator racks. From this point the transmission lines connect into transformers located in the space defined by the four tower posts, and lead from there to the substation by way of a small transmission bracket located on the roof, and roof insulators. The out-door substation equipment is enclosed with a high-woven wire fence as a safety measure.

OVERHEAD CONSTRUCTION

All trolley construction, except that on city streets, is of the catenary type, nine-point suspension carried on mast-arms. It is supported on 9-in. top, 35-ft. Idaho cedar poles spaced at 150-ft. intervals on tangent track, and at closer intervals on curves. The mast-arms are of the usual structural T-beam section, 9 ft. in length, provided with special end-castings at feeder taps and a long bracket steady brace at frequent intervals. Clearance between the top of rail and trolley are fixed at 19 ft. Feeder taps are supplied five to each mile, and lightning arresters at the same interval.

The high-tension transmission line is carried on steel towers along the company's right-of-way, except through the cities, where it was necessary to purchase a private right-of-way around them. This tower line follows the right-of-way from Waco to Waxahachie and from Ferris to Trinity Heights. It was built primarily

SOUTHERN TRACTION—STANDARD SUBSTATION

SOUTHERN TRACTION—COMBINATION LINE AND WORK CAR

to serve a number of lighting and power properties in the cities and villages in this territory. From Ferris to Corsicana the transmission line is carried on wooden poles along with the trolley wire.

On city streets the overhead construction is changed to a simple trolley on span wires. Here also compressed, concealed rail bonds are provided in place of the brazed bond used in open-track construction. In addition to these five crossbonds are installed in each mile and special No. 0000 long bonds provided around switches and railroad crossings. Overhead construction on the bridges and viaducts, where the spans were too long and too high to permit poles to be set in the ground, was provided by setting the poles on structural-steel brackets projecting from the piers and towers. The butt of the pole was set on the bracket and it was tied in just below the bridge deck level by a structural-steel bracket designed to hold the pole rigidly in position. Several typical overhead construction installations are shown in the accompanying illustrations.

Two complete metallic telephone circuits are also carried on cross-arms set immediately below the mast-arms. These were provided for a telephone-selector system furnished by the Western Electric Company. The telephone circuits are No. 10 copper wire mounted on porcelain insulators and each telephone is protected from the high-trolley voltage by a small transformer. Both of these telephone lines are used for train dispatching; a third circuit is to be added and used as a commercial line when required.

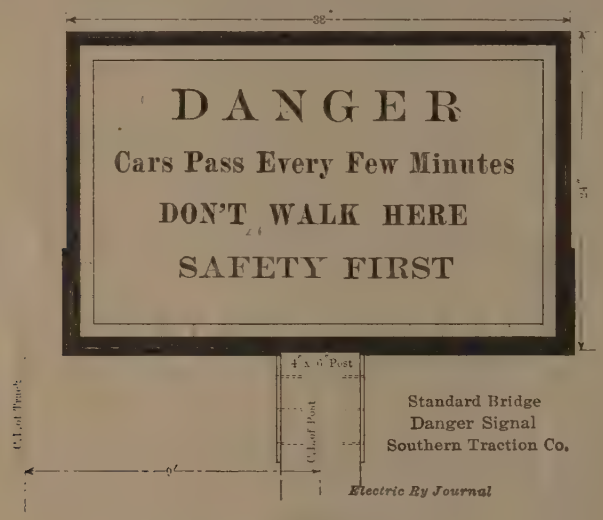
REPAIR SHOPS AND ROLLING STOCK

General repair shops are now being constructed at Monroe, a suburb just south of Dallas, and at the junction point of the lines to Waco and Corsicana. All heavy general repair work for the new line as well as the lines of the Texas Traction Company north of Dallas will be concentrated at this point. Ordinary running repairs necessary to maintain schedules on the Dallas-Sherman line will be done at the repair shop at McKinney, where all repair work is being handled until the new general repair shops are completed.

SOUTHERN TRACTION—OVERHEAD ON TANGENT

A complete equipment of rolling stock including passenger, express and work cars was purchased for this line, and is now in service. This list included twenty-two passenger motor cars built by the St. Louis Car Company, six express motor cars, ten passenger trail cars, two express trail cars and two motor work cars furnished by the American Car Company. All of these cars were built with underframes of composite construction, except the motor passenger cars, which are of semi-steel. The cars are finished in golden oak with tan grain leather upholstered seats. All cars were designed for high-speed. The principal general dimensions of the motor passenger cars are as follows: Over-all length, 53 ft. 6 in.; over-all width, 9 ft.; seating capacity, fifty-six passengers. The electrical equipment in these cars includes four GE-225 motors arranged for single-end control. Each car has a switch to permit full speed operation on either 600 volts or 1200 volts.

The ten passenger trail cars were also designed for high-speed interurban service, and to be coupled in trains of two or more cars each. Each side of the car is framed for seven pairs of double windows with oval-top sashes. The bulkheads at each end are fitted with single sliding doors, which, together with the end win-



SOUTHERN TRACTION—WARNING SIGNS ON BRIDGES

dows, are removable in hot weather. The express motor and trail cars are practically identical in construction with the passenger trail cars, except that they are designed for a carrying capacity of 40,000 lb.

The combination work and line cars also have composite underframes similar to the express motor and trail cars, except for minor changes in size of the steel members. These cars were designed to carry a distributed load of 40 tons at high speed, and the principal dimensions are as follows: Work car: Length over bumpers, 50 ft.; width over sills, 8 ft. 4½ in.; width of cab, 5 ft.; length of cab, 7 ft.; wheelbase, 6 ft. 6 in.; diameter of wheels, 37 in., and Brill trucks 27-MCB-3 with 100 hp GE-225 motors.

The dimensions of the combination work and line car: Length over bumpers, 50 ft.; length of body over cab, 24 ft. 6 in.; width over sills, 8 ft. 4¼ in.; extreme width, 9 ft.; height from track to underside of side sills, 43 in.; height from rail over trolley boards, 14 ft. 10½ in.; height from bottom of sill to top roof of car, 8 ft. 6½ in.; Brill trucks 27-MCB-3 and GE-225 motors. Views of these cars are shown in the illustrations.

GENERAL

The Southern Traction Company was promoted and financed by J. F. Strickland, its president. Its opening was made an auspicious occasion with celebrations in all the important cities along the line. Much stock was sold locally, consequently there was a personal interest in the success of its operation. The road is known as the "Home Interurban." The actual construction was done by the Southern Engineering & Construction Company, of Dallas, of which Burr Martin is president and Luther Dean is vice-president and chief engineer. The operation of this new line, as well as that of the Texas Traction Company, is under the direction of R. B. Stichter, general manager.

The Canadian Radial Electric Railway Act

In a long report which he has made to the Bureau of Foreign and Domestic Commerce of the Department of Commerce of the United States on commercial and economic conditions in Ontario, Consul Julius D. Dreher at Toronto, Canada, says in referring to electric railway progress and to the extension of the radial electric railway:

"The street and rural electric railways in the Dominion have a total first main track mileage of 1357, or, including second main track mileage, a total of 1727 miles. Of the former total, Ontario lines have 543 miles, or 40 per cent, and of the latter 659 miles, or 38 per cent. Of the total capitalization of $141,235,631 the lines in Ontario have $44,591,296, or 31.6 per cent, and of the total net income for the year ended June 30, 1913, amounting to $6,612,575, Ontario lines made $2,710,375, or 41 per cent, which was a net profit of 6.1 per cent on the total capital invested in Ontario lines. Only three of these lines showed a deficit last year, the aggregate loss being $34,197. It is expected that the mileage of rural car lines will be considerably increased in the near future.

"In April last the Dominion Parliament passed an act conferring further powers on the Hydroelectric Commission in order to promote the building of radial, or interurban electric railways. Under the provisions of this act the commission will construct, equip and operate these lines for the benefit and at the expense of the municipalities. The railways will be built with money secured by issues of bonds by the Hydroelectric Commission, guaranteed by the Province. The government will in turn be protected by requiring the municipalities to deposit with the commission debentures covering the expenditure made. The interest, sinking fund, or possible deficits will be met by the municipalities interested. The bonds covering construction will be extended over a period of fifty years, a provision calculated to lighten the burden upon the enterprise, and in order to tide over the first ten years, when the roads are getting under way, the municipalities will not be required to pay sinking fund charges at all.

"As an added protection for the commission, it is provided that where a municipality defaults on its interest or sinking-fund payments the commission shall have the right to go on the market and sell the debentures of that municipality to make up the deficiency. Where the debentures fail to produce the necessary amount the municipalities can still be made liable for any amount still due the commission, as its bonds will be a first mortgage upon the railway property.

"The responsibility for entering upon a radial railway project lies entirely with the municipalities. The commission is empowered to enter into a contract with one or more municipalities, with the approval of the Lieutenant-Governor in council. The agreement or contract must then be submitted to the electors qualified to vote upon money by-laws."

For electrification of railways in Japan the sum of $1,250,000 has been included in the budget for the current year of the Japanese Imperial Railway Board.

The Question of Public Relations

Full Text of Speech Delivered at Public Meeting at Toledo June 25 by Thomas N. McCarter, President Public Service Corporation, Newark, N. J.—The Speaker Discussed the Toledo Situation, the Hazards of the Industry, Rate of Return and Other Allied Subjects

The trouble with this street railway proposition is that most people do not know anything about it. If we who are versed in this business should undertake to tell them as much about their business as they with great nonchalance tell us about ours, they would quickly inform us that we were talking about things we knew nothing of. With what I say on this subject, I have no false modesty. I speak whereof I know, taught in the school of hard experience.

A 3-CENT FARE INADEQUATE

I start with the direct proposition that it is impossible, under present-day conditions, to operate an up-to-date street railway in this country, pay operating expenses and earn interest on the actual cost of the investment on a 3-cent fare. Why this demand for a 3-cent fare? Have the gentlemen who so clamor for such a fare worked it out scientifically? If I understand the principle of rate regulation at all, it is that electric railways, being quasi-public bodies, must be allowed to earn, in exchange for the franchise grants, only a fair return upon the value of the property devoted to the public use. Who has told these gentlemen that a 3-cent fare will do that? Why is it that they clamor so loudly for a 3-cent fare? Why do they not make it 2 cents or 1 cent? It is simply a will-o'-the-wisp, a happy catch word of the politicians.

While I accede entirely to the proposition that in the long run one catches more flies with molasses than with vinegar, and I am willing to go the limit in endeavoring to placate even those whose intelligence I may not respect, I do not propose that the interests I have in hand shall be ridden over rough shod by the demagogues and the cheap politicians without a fight. I venture to say that of those in authority clamoring after this fare at the present moment, there is not a single man, in this city or elsewhere, who can tell you the basis of his belief, other than that the companies under discussion are public service corporations, that fortunes have been made out of those properties, perhaps improperly, in the past, and that, all things considered, 3 cents is enough for them. The whole 3-cent fare agitation is uneconomical and unsound, and as soon as the people of this country get that in their minds the better for everybody, including themselves.

The railway property of the Public Service Corporation of New Jersey has gross receipts of approximately $16,000,000 a year. We furnish with transportation all of the larger cities of the State of New Jersey, with the exception of Trenton, and many of the smaller ones. We operate large city, suburban and interurban properties. We have a straight 5-cent fare with a very liberal transfer privilege, so that the county rather than the city is largely our 5-cent fare limit. To that extent we are liberal. Sixty per cent of a 5-cent fare is 3 cents. In 1908 our vast system was operated for 61.7 per cent of its gross receipts. In 1909 it was operated for 59.1 per cent of its gross receipts, in 1910 for 60 per cent, in 1911 for 63 per cent, in 1912 for 63.6 per cent and in 1913 for 63 per cent. Where would we have been with a 3-cent fare? We would not have paid operating expenses, except in one year, when we would have had 0.9 per cent over.

Some one will say that the 3-cent fare will very largely increase the receipts because of the large increase in the riding habit over what it would be with a 5-cent fare. It is not so. We have just been through an experience of this character in our gas business. For many years our average increase in the output of gas has been 7 per cent. A year ago the Public Utilities Commission of New Jersey reduced the price of gas from $1 to 90 cents per 1000 ft. and they and the people of New Jersey said that we would more than make up the decrease in price through the increase in consumption. The first year, under the 90-cent gas rate, we increased a little over 6 per cent, or less than the 7 per cent average of the preceding ten years. The same result was demonstrated in the New York Consolidated Gas Company matter, where the price of gas was reduced from $1 to 80 cents with absolutely no abnormal increase in consumption.

HAZARDS OF THE INDUSTRY

We are at the parting of the ways with these industries in this country. I am not an apologist for the past. I know money was made out of public utility properties in the early days, and that some things were done which would not be countenanced now. I am not so sure that they were wrong. You must remember the electric railway industry is only twenty-six or twenty-seven years old. I still adhere to the principle that a man who has the hardihood to venture his money in a new and untried art that develops and changes over night, is entitled to make a good profit, something more than interest on his money. If he were not entitled to such a profit, he would be a fool to go into the enterprise. It is easy when success is assured to begin to talk about cutting down the rate of return to something more nearly normal, but when you are talking about the industry that in only twenty-seven years has almost revolutionized transportation in the world, it is too soon to begin to cry "Wolf" and to attack the early investors because they have made money out of it.

When this country wanted a transcontinental railroad built, it held out very great inducements to the promoters who would build it. Among other things, the government gave thousands of acres of land along the line of the Union Pacific Railroad. After the Union Pacific became a success, it undertook to take the land back. Was that fair? Did not the men who had the hardihood to go into that enterprise have the right to keep this land? They did, and the United States Supreme Court said so. It is the same thing in this matter of ours. A few years ago some gentlemen had the hardihood to build tunnels under the Hudson River, connecting the States of New York and New Jersey. Nothing has ever been done that has been as great a boon to New Jersey as the making of these tunnels, but the venture has not been a success. The property has had to be readjusted, and the bonds which were issued only for investment have had to be scaled down, half being mortgage bonds and half being income bonds. The company is now earning interest on the mortgage bonds and hopes some day to earn interest on the others. Will anyone say that those gentle-

men who had the temerity to put their money in the bowels of the Hudson River and connect the great States of New York and New Jersey by rapid transit, should, if their enterprise ever does prove successful, be limited to a 6 per cent return on their investment? If this is adopted as the policy of this country it certainly means to say that no such enterprise will be established, for no man will be fool enough to undertake the risk and hazard of such an extraordinary enterprise under such conditions.

Would any of you take a franchise to-day for airship work and put your money into it? Would any of you back an enterprise that had transportation between here and Detroit by air for its object? It is not any more unlikely, thirty or forty years hence, that there will be such a means of locomotion between here and Detroit than it was thirty years ago that street railways would be what they are to-day. If you and I had the hardihood to back an enterprise of this kind and we waited until the people began to use it, would we not be entitled to more than 6 per cent on our investment?

FAIR RETURN FOR ESTABLISHED PROPERTY

After a property has become established, as ours is at present, though not firmly, a different problem presents itself. There should be no extraordinary or improper return, but the return should always be substantial and above the legal rate of interest. Otherwise I, for one, who have some idea of the annoyance and responsibility of this work, would leave my money in a savings bank or take a mortgage on real estate, and leave the troubles of this business for someone else. What is a fair return on the hazards of the business? I cannot say, but I know it must be sufficient to attract capital. It must be sufficient to keep the property developed up to the needs of the city, and, by and large, it should never be less than 8 per cent on the value of the property devoted to the public use. Otherwise capital will flow elsewhere into different channels with less hazard. Any community that seeks to pare down the return below this point hurts not only the traction company but more especially itself.

When I was president of the American Electric Railway Association, I went from one end of the country to the other making speeches. The great value of this was that I saw how the different properties were operated and how they were developing the cities of the country, and I say, without fear of contradiction, no one other single element that has arisen in the last twenty-five years has so developed the American city as have the electric railways of this country. And they will go on developing this country if they are allowed to. Just think how they have revolutionized the lives of the people of the cities. Just think how they have made it possible for men of moderate means to live in the suburbs and to own their own homes instead of living in the congested centers in tenements. All has been done with a maximum of a nickel fare, throughout the length and breadth of this land, and yet the cry goes up that we are robbing the poor people and robbing the country, when as a matter of fact we have not only done this development work but have also created untold amounts of wealth for the individual property owners, and also for the cities themselves through the medium of the increase in tax values. It is such a mistaken point of view for municipalities to try to draw the last drop of blood and insist upon the last pound of flesh. How much better it would be, instead of the turmoil that is in Toledo at the present time, to have a company allowed to go on in its own way, regulated, with rates so that the return would be commensurate with the service rendered, but so that the company could get the necessary capital to develop the city. How much better would every individual be if that were the case, instead of having the present condition prolonged to an indefinite future, with a saving once or twice a day of some portion of a cent.

RESULTS OF 5-CENT FARE IN NEW JERSEY

I said we had in New Jersey 5-cent fares. So we have, but by the operation of the transfer system it is reduced, as far as the fare per ride goes, to 3.8 or 3.75 cents. That is the fare that every passenger who boards a car, whether for a cash ride or a transfer ride, pays us. A 5-cent fare, or this 3.8-cent fare, enables us to pay our operating expenses, pay a reasonable return upon the investment of capital, and, what is more important, obtain the necessary new capital for further development. In the eleven or twelve years of my administration, there has been invested between $30,000,000 and $40,000,000 in the development of the railway property alone. Under present conditions in Toledo, how long will it be before that sum of money is invested here?

Only yesterday I had the great privilege in the city of Newark of turning the first operation of a steam shovel on a new electric railway terminal which we are about to construct for the purpose of taking our cars off the congested centers of the streets. We approach this terminal along the one side by a subway a quarter of a mile long, and on the other side by an elevated line a quarter of a mile long. On the ground floor of this building will be a great concourse, like that of the Hudson Terminal, one flight down to the subway and one flight up to the elevated. When the terminal is done, we shall be able to double the cars now in use, and we hope to increase our business very materially. It will cost more than $5,000,000. We had no trouble to get the money because of the conditions I have spoken of, but if you needed such a terminal in Toledo at this time, you would have a nice time getting any $5,000,000.

The answer to the whole proposition is that while there are peculiarities about this business, it is like every other business; it is governed by inexorable economic laws, which no amount of skullduggery or tomfoolery or political nonsense can overcome. Some people say I am blunt and tactless at times and undiplomatic. I am all through with trying to soft soap these things to a successful issue. I propose, for one, hereafter to stand up and be counted and let the people of any community in which I am interested know just what they are doing, not only to me, but to themselves.

THE FRANCHISE QUESTION

I know it is hopeless for me to attempt to change the attitude of the Middle West, or perhaps the rest of the country, on the question of short term franchises, but I also know that the principle of a short term franchise is all wrong. It is uneconomical and unsound. I do not argue for the old fashioned, unregulated, perpetual franchise, which allows properties to be exploited by a few men for the benefit of themselves. Now that regulation has come to stay, as it has in this country, these things are a thing of the past. The question of the length of the franchise, from the standpoint of the municipality, is relatively unimportant, whereas to the company itself it is of vital importance. Some say a twenty year franchise is long enough, and they ask you to make a large capital investment or to retain your present capital investment, with a twenty year franchise, and let the future take care of itself. Suppose any of you leased a piece of property on any of these main streets, where the property values are high, for ten years, and only for that period, and you went ahead and put a large mercantile building upon it, cost-

ing $100,000. Would not any reasonably prudent man, if he had only a ten or twenty year lease on that property, charge off one-tenth or one-twentieth of the value of his property as he went along? If these short term franchises are to be granted without any hope in them beyond the limit of the day to which they are granted, then I say it is the duty of the company to amortize its investment. In such a case, who must pay for the amortization? The people who ride on the car. It becomes an operating expense, or a fixed charge, an expense akin to an operating expense. In other words, it is a short-sighted policy on the part of the municipalities to insist on short term franchises unless they want to put an undue burden on the present generation. The length of a franchise period becomes immaterial when it is assumed that there is a commission that will enforce good service and reasonable rates. These constantly recurring periods, such as occurred a few years ago in Chicago and Cleveland, and such as is now going on in Toledo and is about to burst wide open in Detroit, hurt the community. If this franchise question did not come to a head with such periodic frequency, but went on either indeterminately, or so that the amortization would be spread over a long period of years and not fall so heavily upon the present generation, it would be better for all concerned.

MUNICIPAL OWNERSHIP OF RAILWAYS

I recently appeared before a committee of the House of Representatives in Washington, which had before it a proposition to condemn the street railways of the city of Washington for governmental use. The committee of the District of Columbia, before which I appeared, consisted, I think, of a total membership of twenty-one men. They were called together to hear what was to be said upon this very important question, and at one time while I was talking there were actually five of the twenty-one present. That committee has since voted nine to eight to report the bill. I have not much fear that the bill will pass, but I do say that for a Congressional committee composed of twenty-one members to give such a scant hearing and attention to this vital matter is a travesty upon our system of politics, and something will have to be done by the legislature if it is going to carry on its work in committees, to overcome this evil. Mr. Brady confirms this, because he recently appeared before a Senate committee in an equally important matter and had practically the same experience. We were representing vast amounts of capital and should have been granted a full hearing, so that the committee members might at least know upon what they were voting, which was not the case with the recent vote in favor of condemning the Washington railways.

In regard to the wisdom or foolishness of municipal ownership, my own judgment is that it is a very foolish thing for this government or for our municipalities to undertake. I am willing to admit, with some reservations like the one just spoken of in Washington, that our scheme of national government has been a great success. Our fathers built better than they knew, and we have had a hundred and thirty-five years of marvelous success. With the state governments the plan has also worked well, and in the main they have been honest and economically managed. Who can say the same thing about our municipal governments? Municipal government, as it has been worked out in the United States up to the present time, is a failure. The municipal governments in this country have not been as practical, so far as the personnel of the men, the results obtained, and the efficiency of the government concerned go, as have the national and state governments. Upon this premise, of which I defy contradiction, does it seem wise to turn over to these gentlemen, who have already made a failure of almost everything they have undertaken, the burden of the operating of public utilities?

Some utilities are easier to operate than others. The gas business, for example, is all underground and not in the public eye very much. The street railway business, however, is before you every day and many times a day. The men operating the cars are coming in constant contact with the public. Some times they lose their tempers, as much as we try to keep them from it, and, stranger still, sometimes a passenger loses his temper. Imagine what kind of operation you would have, after a short time, with these street railways in operation under the guidance of the municipal governments of this country. But, even if they were equipped to do their present work well, have they not about enough to do—parks, play grounds, sewers, schools, libraries, streets, paving, water supply, and all the rest of it? Is it not too much to turn over to these already overburdened cities the operation of all these utilities? Moreover, think of the money involved. We showed the committee in Washington that to take over the Washington railways would require not less than $50,000,000. If they would come knocking at the door of my company in New Jersey, I can promise them that the price would be not less than $300,000,000 on a careful valuation. Think of the straining of municipal credit, already overstrained in this country, if the cities attempted to buy such properties. If they began borrowing these enormous sums of money, how long would they remain on a 4 per cent basis, if they are on that basis at the present time? Before they knew it, the municipal rate would be up to 6 per cent. But the municipal ownership advocate says that even if it is 6 per cent, the company wants 8 per cent, so that the rate will be 2 per cent cheaper anyway. How long would that 2 per cent last as between efficient private operation and municipal ownership? In my judgment, it will be a sorry day for this great republic when, in addition to all the present troubles these municipalities have, they take upon themselves the operation of public utilities, paying for them sums running into the thousands of millions of dollars.

All I ask on this subject of municipal ownership is that self-respecting citizens should come and reason together, and try to decide whether, after all, the better way is not to let these companies continue to develop the communities in which they operate and make a fair return upon their money invested, thus enticing more money for further developments, rather than embarking upon the seas of municipal ownership, with its dire and dread consequences. Let those of us who are operating these properties realize our responsibilities and hold ourselves to the full measure of our duty toward the public, devoting our surplus energy to improving conditions wherever we can. I know the men who are engaged in the electric railway business in this country, and I say that nowhere is there a more honest, loyal, devoted, patriotic set of men in any business in this country. Our business did not exist at the time of the Civil War, but the railroads existed at that time, and the history of that war is replete with the patriotism and the valor of the men who were then operating the great steam roads. Many of them laid down their work and went to the war, and those who stayed operated the railroads through that crisis, first for their country and then for the owners of the properties. And so it would be the same to-day. There has grown up a feeling in this country that a man connected with a large public utility corporation is hardly fit to associate with. I resent this feeling, for myself and all those who are interested in this busi-

ness, because I know that each and every electric railway man is just as solid and sober a citizen as one from any other class of men in this country.

Many of us are trying to do what we can to improve conditions among those that work. The companies have welfare funds and minimum wages for female employees, and in many other ways they are vieing with each other to better the tone of all those laboring for them. Let us devote ourselves, after we have done our duty to our communities and to our stockholders, to this ennobling work, first, because it is right; second; because it will make the world a better place to live in, and, third and selfishly, because it should help to stem this tide of thoughtlessness that seems to be so prevalent about us.

I have been discouraged at times, just as have many of you who are operating these properties, but I am not finally and eternally discouraged. I believe the dawn is coming when our properties are to be recognized on a higher plane than they have been in the immediate past, and that the good judgment of this country, perhaps differing in the non-essentials, will say that the philosophy that I have tried to give thus far, is, after all, not only for the welfare of the public, but for the country at large.

Interstate System of Accounts

The complete system of accounts prescribed by the Interstate Commerce Commission for electric railways subject to its jurisdiction has been issued. The accounts are effective on July 1, 1914.

The order of the commission prescribing the adoption of the accounts is in part as follows:

"Any such carrier or any receiver or operating trustee of any such carrier may subdivide any primary account established in the said issue (as permitted in the general instructions contained in the said issue); or may make assignment of the amount charged to any such primary account to operating divisions, to its individual lines, or to States. Provided, however, that such subprimary accounts set up or such assignments made by any such carrier or by any receiver or operating trustee of any such carrier do not impair the integrity of the accounts hereby prescribed.

"In order that the basis of comparison with previous years be not destroyed, any such carrier or any receiver or operating trustee of any such carrier may, during the twelve months from the time that the said issue becomes effective, keep and maintain, in addition to the accounts hereby prescribed, such portion or portions of its present accounts as may be deemed desirable by any such carrier, or by any receiver or operating trustee thereof, for the purpose of such comparison; or, during the same period, may maintain such groupings of the primary accounts hereby prescribed as may be desired for that purpose.

"Any such carrier or any receiver or operating trustee of any such carrier, in addition to the accounts hereby prescribed, may, unless otherwise ordered, keep any temporary or experimental accounts the purpose of which is to develop the efficiency of operation: Provided, however, that such temporary or experimental accounts shall not impair the integrity of any primary account hereby prescribed."

The introductory letter of Fred W. Sweney, chief examiner of accounts, says:

"This uniform system of accounts for electric railways supersedes the classifications of expenditures for road and equipment, operating expenses and operating revenues which became effective Jan. 1, 1909, and all conflicting instructions contained in Accounting Bulletin No. 7.

"In formulating this uniform system of accounts for electric railways, containing the first revised issues of the classifications of operating expense, operating revenue, and road and equipment accounts, and also the first issues of the classifications of income, profit and loss, and general balance-sheet accounts, it has been the purpose to enlist the co-operation of representatives of electric railways and of the various State commissions. Accounting series circular No. 41, containing a tentative system of accounts, was submitted to the representatives of all such carriers of record in this office and to each of the State commissions for criticisms and suggestions, and careful consideration has been given to all replies received.

"In the preparation of the revision of the accounting rules contained in this system of accounts for electric railways the commission has had the co-operation of the committee on a standard classification of accounts of the American Electric Railway Accountants' Association.

"Special attention is directed to the provisions for depreciation. The use of account No. 40, 'depreciation of equipment,' is mandatory. Until further notice the use of account No. 25, 'depreciation of way and structures,' and No. 50, 'depreciation of power plant buildings and equipment,' is optional with the carrier.

"In order that uniformity in the application of the provisions of these classifications may be secured, accounting officers are requested to submit all questions of doubtful interpretation to this office for consideration and decision."

The general instructions on operating expenses say regarding depreciation:

"Depreciation accounts in which to include monthly charges to cover depreciation of way and structures, equipment, power plant buildings, and power plant equipment are provided in order that carriers may create reserves which will meet or reduce the amounts otherwise chargeable to operating expenses or to profit and loss account to cover the cost of the renewal or retirement of property. Such depreciation charges should be upon a basis determined to be equitable according to the carrier's experience and best sources of information as to the actual accruals of current loss from depreciation. Depreciation charges with respect to property or equipment shall cease when the difference between the ledger value (estimated if not known) and the estimated scrap value shall have been credited to the depreciation reserve account. A statement of the bases used by the carrier for computing these charges shall be included in its annual report to the commission.

"Commencing July 1, 1914, carriers shall accrue depreciation on equipment (included in accounts Nos. 530 to 535), but the accrual of depreciation on way and structures, power plant buildings, and power plant and substation equipment is left optional with the carrier until the commission shall direct otherwise.

"When equipment (included in accounts Nos. 530 to 535) is retired from service and proper charges for depreciation have not been made during its life, the ledger value of such equipment, less salvage and depreciation accrued to the date of retirement, shall be charged as follows: That proportion of the actual loss from depreciation equitably assignable to the period prior to July 1, 1914, shall be charged to profit and loss and the remainder shall be charged to operating expense account No. 41, 'equipment retired.'"

The outing of the Jovian League of Louisville, Ky., will be held at Sennings Park on July 14, and will consist of a dinner dance on the cabaret order. A special orchestra will furnish the music.

Meeting of New York Association

The Main Topics at the Thirty-second Annual Meeting of the New York Electric Railway Association Were Employees' Accident Insurance, Accident Prevention and Efficiency in Operation

The thirty-second annual meeting of the New York Electric Railway Association was held at the Hotel Champlain, Bluff Point, N. Y., Tuesday and Wednesday, June 30 and July 1, 1914. The program was of the most timely character, the chief subject being that of employees' accident insurance in view of recent New York legislation on this matter. About 200 delegates and other visitors attended the sessions and annual banquet.

TUESDAY MORNING SESSION

The session on Tuesday morning opened with the usual routine business. President Hedley welcomed the convention in a most striking address on the big problems now before the railway operator.

PRESIDENT'S ADDRESS

Mr. Hedley said that in these days there was a greater field for the association than ever before because the electric railway business of late had gotten into a situation where it must be carried on with an absolutely new set of rules. Most operators in the past had been compelled to run their business in a way that would not be tolerated to-day. Many of the railways in the State, he could safely say, had been founded and capitalized under conditions that would not now be permitted—conditions that made it extremely hard for a manager to make a good showing. So the new rules were not altogether against the managers. Some of the new rules under which the railways were now being financed were very good for the operators. There had been a time when a manager who had come to the point of meeting the existing fixed charges was confronted by the financier's demand to meet the interest on a new issue of unloaded securities. Such things could not be done nowadays, and that was of great advantage to the manager.

Two things, however, of the greatest importance were left to the manager, and to these the association was giving ample attention. One was the safe operation of their properties—that meant a great deal. He did not believe that the best way of handling this problem was to send a laborer over the system to stencil "Safety First" on every shanty, plank and box. This was to make a jest out of a great movement and to harm instead of benefiting it. "Safety first" must start with the manager and must go down through his various subordinates to the commonest laborer. The matter of safety was one that was up to the managers more than to the public authorities.

The second thing now before the managers, and one in which the public authorities could interfere, was that of efficiency. This problem, like the price of liberty, demanded eternal vigilance. He did not see how it was possible for any legislation or legislators to do anything to take these two things—safety and efficiency—away from the railway manager.

Following President Hedley's remarks, the Hon. James J. Hoey, second deputy superintendent of insurance of the State of New York, delivered an address on "Employees' Accident Insurance," which will be found in abstract elsewhere in this issue.

DISCUSSION ON MR. HOEY'S PAPER

J. S. Kennedy, secretary benefit fund committee New York Telephone Company, spoke of the welfare work of that company and other Bell organizations. Eighteen months ago the New York Telephone Company and all other Bell companies in the United States had set aside the sum of $2,000,000 as a permanently unimpaired fund for general welfare purposes. Pensions are granted to all male and female employees after twenty, twenty-five or thirty years of service, according to certain conditions, and after only fifteen years in case of total disablement. For accidents an employee, regardless of term of service, receives full wages for the first thirteen weeks and half wages for an indefinite period thereafter during the continuance of disability. For death by accident, regardless of term of service, three times the annual salary, with a limit of $5,000, is paid. For death by accident to an employee of five years' service, his heirs received six months average wages; for a like cause, the heirs of a ten-year employee received one year's average wages. For sickness, after two years or more of service, sick benefits of the same nature as the accident benefits are paid. The Bell companies were self-insured, and permission to continue such self-insurance had been granted by the Workmen's Compensation Commission of the State of New York.

Mr. Kennedy pointed out that the compensation provisions of his company were more liberal than demanded by the State of New York. For instance, the law grants no weekly accident compensation for the first two weeks, while his company had it begin immediately. His company was now co-operating with the commission to harmonize a number of differences on this general subject. In concluding, he said that 97 to 98 per cent of the telephone company's accidents caused disability lasting for less than thirteen weeks, while 76 per cent were for less than two weeks.

Capt. W. B. Rockwell, Eastern Pennsylvania Railways, Pottsville, Pa., thought it was the height of folly to expect women to get off cars the right way from instructions merely by use of posters. Where passengers were under the control of the conductors, the latter alone must be held responsible for safety. Mechanical appliances were not the most important means for preventing accidents. Far more could be accomplished by square treatment of the men, for this in turn would lead them to reciprocate by using greater care in operation.

Mr. Hoey observed, however, that the mechanical arrangements of the New York stepless car were such as to make boarding and alighting accidents impossible.

Mr. Rockwell said that he also believed in the stepless car, but since such a car required maximum traction trucks it could not be used where grades were heavy.

President Hedley complimented Mr. Hoey on the sincerity of his paper. However, he did want to take exception to his statement that operators wanted their crews to make time regardless of safety. He knew that no good operating man would ever countenance such a practice. As to accidents, President Hedley said that his company's records showed that women took better care of themselves than men, so why direct so much attention to the ladies? Mechanical safety appliances were a necessary curb on stupidity.

The session was adjourned after a rising vote of thanks to Mr. Hoey.

TUESDAY AFTERNOON SESSION

President Hedley opened the afternoon session by introducing Martin E. Burke of the Interborough Rapid Transit and New York Railways legal department. Mr. Burke said that the companies named, as well as the Third Avenue and New York & Queens County Railways, had decided to insure themselves because it was cheaper. Further, as a part of their welfare work, these companies for years had been paying their men where no liability existed. He believed that nothing would make railways more careful than if they had to pay out large sums of money directly instead of indirectly through premiums to insurance companies. The existing organization was such that this self-insurance could be carried at say $100 extra a year in clerical expense. He believed that it was perfectly feasible for the State to quote lower insurance rates than stock companies, as the latter must pay for solicitors and give dividends to stockholders. The State fund has no such expenses, and for the first two and one-half years the cost of operation will be absorbed by the State at large. An important reason for favoring the State fund was that if a stock company failed the policyholder therein would not be absolved from liability, whereas the State fund insured this absolute release from liability. He was still more in favor of self-insurance because it would be cheaper in the end. The only difference was in the State fund's provision for medical and hospital attendance, but his companies had taken care of their men in this respect anyway. These companies were also more liberal in paying the wages of injured men from the start instead of waiting two weeks. Payment in such cases was made upon recommendation of the injured man's foreman and superintendent. The new law required medical attention to be given for eight and a half weeks. The practice on his companies' properties was as follows: "First-aid" men who had been trained by the chief surgeon were stationed at the shops and other places where groups of men were working. The chief value of the "first-aid" man was to prevent little hurts from becoming big. An improperly treated scratch or cut, for instance, might easily lead to blood poisoning. If the injury required further attention, the employee was sent to a local doctor. Following this, he could be sent to any of four hospitals, where he would be placed in semi-private quarters under the care of high-class physicians and surgeons. Even after leaving the hospital he is free to return to the care of these men instead of going to a dispensary. Arrangements are also in force for treating men at their homes.

MR. PHILLIPS ON ACCIDENT INSURANCE

The next speaker was Cyrus W. Phillips, deputy commissioner Workmen's Compensation Commission of the State of New York. Mr. Phillips prefaced his remarks by saying that it would be better for our system of legislation if business men gave their attention to laws while they were in the making rather than to criticise these laws after they had been passed. Mr. Phillips then referred to the old law of negligence. This was a fiction set up by the courts under which an employee had been prevented from getting damages if he or his fellow servants were negligent or if the injury was due to the risks of the occupation. All this had been eliminated by the compensation law, the fundamental idea of which was that an industry should bear the cost of scrapping a workman as it had borne the cost of scrapping a machine.

For many years legislation had been advocated and passed to do away with the negligence and occupational barriers set up by the courts. In the federal law the fellow-servant, assumed risk, and contributory negligence rules had been swept away, and, in addition, a safety appliances law had been passed. Thus the compensation law would put a stop to measures which would have proved more costly in the end. Some twenty-six States now had compensation laws, but the New York law differed from most of the others in being compulsory instead of elective. Where selective insurance was in vogue, support of the law seemed to meet with a heartier response. However, he had found that where the agreements between employer and employee were not controlled by the State, as in New Jersey, many of the agreements filed with the Department of Labor showed that the employers had failed to pay the proper compensation. In other States, as Massachusetts and Michigan, the agreements were subject to correction. In general, the New York law was more liberal to the worker than any other either in the United States or Europe. He appreciated the fact that while other employers could add the cost of insurance to that of their product, the electric railway with a straight 5-cent fare could not.

C. S. Sims, vice-president and general manager Delaware & Hudson Company, said that the premiums under the new law would amount to 20 per cent of one steam railroad's net earnings. He also believed that smaller manufacturers might be tempted to leave the State because of the burden imposed by the law.

Mr. Phillips replied that the steam railroad would have had to pay in any event because of the federal laws. As to manufacturers, the premium amounted to no more than 0.5 per cent of their business, and this difference was too small to cause removal to the States that had no compensation law. In conclusion, Mr. Phillips pointed out that the reason for not paying benefits during the first two weeks was to prevent beneficiaries from staying home unnecessarily.

Mr. Gonzenbach's address on "Accident Insurance" was then presented. It will be found on another page.

MR. BALDWIN ON ADVANTAGE OF INSURING IN STATE FUND

The next speaker was F. Spencer Baldwin, manager State Insurance Fund, Workmen's Compensation Commission, State of New York, who spoke on the advantages of insuring in the State fund. Compared with stock companies, the State fund offered the only real insurance obtainable if insurance meant protection, release from liability and immunity. Under Section 53 of the law, the employer is granted a full release from liability if he insures in the State fund. On the other hand, the employer must assume the liability himself if the stock company fails. As a matter of fact, such companies differed widely in stability, as was proved by the fact that thirty British insurance companies had become insolvent since 1897. The State fund gave complete protection at the lowest cost. The rates were 8 1/3 per cent below those of the stock companies and were subject to further reduction for meritorious records and equipment. A reduction of 20 per cent in the premium rate was made if the employer had his own system of medical treatment. The rates were subject to still further reduction through dividends for given groups. The State fund eliminated the great economic waste of solicitation for insurance business for, he said, paraphrasing Shakespeare's statement: "None are born insured, some achieve insurance, but most have insurance thrust upon them!" Whether a man insured through a stock company or with the State fund direct, the money for benefits came to the latter anyway. The compensation law was a tax, and why pay an additional tax to a tax-gatherer? Nor was

there anything in the argument about the superior service of stock companies because the law would be administered only by the commission. The inspection service upon which reductions for merit will be made would also be administered by the commission through a central bureau.

Mr. Baldwin also believed that the State fund would prove superior to mutual insurance owing to the superior reliability of the fund, no expense for management and no liability of assessment up to 100 per cent. He doubted also whether mutual insurance was desirable for conditions where payments had to extend for more than a generation. The State fund offered to employers in the same business unusual advantages if they would make up a group of say 3000 employees so that they could obtain all the advantages of mutual insurance without its drawbacks. The same prospect of dividends would exist, while in case of trouble the special mutual fund would be backed up by the State fund as a whole. He hoped that the association would see fit to appoint a committee on this subject. Should the mutual group have its own hospital treatment, a reduction of 20 per cent would be made; and for meritorious safety methods and equipment, a reduction of 40 per cent was possible. He did not believe that the State fund would get the bulk of the business at first because of misapprehensions and the misstatements made regarding its purposes, but in time the State fund would come into its own.

Mr. Gonzenbach said that his paper might have given the impression that he was absolutely for insurance in a mutual fund; but the mutual feature in connection with the State fund appealed to him greatly and was worthy of study by the association. He realized that the liability of a catastrophe was decreased by cooperating with the larger fund.

In reply to a question, Mr. Baldwin said that employers whose equipment was below standard would have to pay a differential or penalty rate. In answer to another question, he said that an employer could withdraw from the State fund at the end of a year to insure otherwise if he wanted to. The reference in the law to "liability to assessments" had been left in inadvertently, for the law contained no statement as to its collection, etc.

President Hedley said he had learned a great deal about the law from Mr. Baldwin's remarks. He asked Mr. Baldwin to prepare a statement showing how the mutual plan for 3000 men or more could be applied to the State fund, and promised that this statement would be sent for consideration to all the members of the association. On the motion of J. S. Doyle, he also announced that a committee would be appointed to confer with the commission's men on this subject with a view to deciding upon insurance plans for next year.

APPOINTMENT OF NOMINATING COMMITTEE

After a vote of thanks had been tendered to the speakers of the afternoon, President Hedley announced the nominating committee as follows: E. S. Fassett, J. K. Choate and W. H. Collins.

The meeting was then adjourned.

WEDNESDAY MORNING SESSION

On Wednesday morning J. P. Barnes, general manager Syracuse & Suburban Railroad Company, Syracuse, N. Y., read his paper on "Accident Prevention" scheduled for Tuesday. This was followed by a symposium on "Efficiency," comprising three papers by C. J. Witherwax, general passenger agent Schenectady Railway Company, Schenectady, N. Y.; F. A. Bagg, chief engineer Fonda, Johnstown & Gloversville Railroad Company, Gloversville, N. Y., and W. H. Sawyer, E. W. Clark & Company, New York, N. Y., respectively. These papers were not discussed and on account of lack of time, the questions propounded in the "question box" were not brought up for discussion.

The following were then elected to the offices named for the ensuing year: President, James F. Hamilton, general manager United Traction Company, Albany, N. Y.; first vice-president, John J. Dempsey, superintendent of transportation New York Consolidated Railroad, New York, N. Y.; second vice-president, James F. Barnes, general manager Syracuse & Suburban Railroad Company, Syracuse, N. Y.; secretary and treasurer, Chas. C. Dietz, New York, N. Y.; members executive committee, S. W. Mower, general manager Otsego & Herkimer Railroad Company, Cooperstown, N. Y.; Wilbur C. Fisk, president Hudson & Manhattan Railroad, New York, N. Y.; Ernest Gonzenbach, general manager Empire United Railways, Inc., Syracuse, N. Y., and W. O. Wood, general manager New York & Long Island Traction Company, Hempstead, L. I.

After resolutions of appreciation of the successful efforts of the outgoing officers and of all others who had contributed to the success of the meeting had been passed, Mr. Hamilton took the chair. He expressed his appreciation of the honor and responsibility conferred upon him and adjourned the convention. The total registration exceeded 150.

DIVERSIONS OF THE CONVENTION

Superimposed upon the more serious features already described there was an unusually attractive program of entertainment. The baseball game between the "peddlers" and the railroad men, played off on Tuesday was a star feature. Captains Frank Hedley and C. C. Castle starred as pitchers while W. B. Rockwell was a remarkable first baseman and J. K. Choate shone as a base runner. The score was somewhat in doubt, as Umpire Harry Evans was roughly handled at times. It was finally adjusted at 22 to 21 in favor of the supply men. The high score gives a false impression of the fine quality of the playing. A handsome engraved brass vase has been donated as a permanent trophy. Golf was, of course, the absorbing pastime of the convention. Under the direction of N. M. Garland there were three competitions. The first was for the state association championship, a 19-hole medal play handicap with about twenty-five entries, won by C. R. Ellicott. There were also a blind handicap and a ladies' clock golf competition. There were also informal dancing at various times in the ballroom of the Hotel Champlain, a ladies' bridge whist contest and an excursion to Ausable Chasm. Altogether the splendid weather, the large attendance of ladies and the excellent hotel accommodations combined to make the convention a social success.

THE BANQUET

The banquet on Tuesday night was accompanied by the usual good oratory on the smiling and serious aspects of the electric railway business. W. L. Conwell, vice-president and treasurer Transportation Utilities Company, New York, was the first speaker. He noted the many rapid changes in standards and methods that had been made during a period of rising prices for manufactures but of a fixed price for fares. The public was justified in demanding good service, but the railways must be granted conditions which would give them a just return on their investment after due expenditures for operation, depreciation and obsolescence. He deplored the fact that politics should have injuriously entered into the conduct of a great industry. Speaking in a lighter vein, and as a manufac-

turer, Mr. Conwell said that the convention afforded the supply men a chance to mingle with the railroaders on other matters than delayed shipments, defective apparatus and unsatisfactory prices. He hoped that no condition that would prevent their attendance would ever be brought about.

E. A. Maher, Jr., assistant general manager, Third Avenue Railway, New York, said that these were parlous days for electric railways. Some railway men thought that public service commissions and workmen's compensation commissions were as useful as a corn plaster to a mermaid; but he felt that such commissions had the possibilities to do great work. The situation as to railroads had changed very much in the past few years. The time was not long distant when those in charge of public utilities had tried to play a confidence game with the public and public officials. Now conditions had changed, for the railways were taking the public and officials into their confidence. Every railway man now wanted to play the game with the cards on the table. He took the position that the public from which every penny of income came was entitled to know what the railways were doing and how that income was spent. The railways must give the widest publicity to their acts to convince the world that there is a community of interest between the railways and the people so that the interest of the people demands that they back up the railways. The period of explaining before government commissions the deeds of bygone days was over. Now the period had come when the railways could explain their acts beforehand and thus prove that they are conducting their business honestly and fearlessly.

President Hedley in commenting upon Mr. Maher's remarks, said that a few years ago the railway owner had not permitted the operator to play the game with the cards on the table, but now it was the kind of a game that they had to play. This change was one of the greatest helps that the railway manager had ever been given. The financiers could no longer flood the operators with securities that did not represent the investment of real money, and it was right that they were no longer permitted to do so.

The last speaker was Howard MacSherry, attorney Public Service Corporation of New Jersey. He opened jocularly by saying that he also was fond of playing with the cards on the table, but he wanted to select the cards. He did not see why electric railway men should be apologizing for their business all the time. They should fight back. Electric railway men should take a more active part in politics instead of permitting irresponsible men who had never shown constructive ability to run the railway business from some government office. If he had a mission to preach it was that business men should take a hand in the business affairs of the nation to protect what they had themselves created.

Power Station Improvements at Danville, Ill.

The Danville (Ill.) Street Railway & Light Company now has improvements under way in its power station which, when completed, will make that station one of the most modern on the Illinois Traction System, of which it is a part. Two 4000-kva, 2300-volt, three-phase, sixty-cycle General Electric turbo-generators will be installed in an addition to the present building. These machines will be among the first 4000-kva units ever manufactured to operate at 3600 r.p.m. The old reciprocating engines which have been acting as reducing valves on the heating system and also supplying electrical energy, will be retained in their present position and operated during the steam-heat season. The new condensing turbines will carry the load during the summer months.

One of the chief engineering problems confronting J. E. Johnson, manager of the Danville company, in connection with these new units was that of condenser arrangement. Two surface condensers with approximately 8000 sq. ft. of surface will be purchased and installed beneath the turbines, the bottom of the hotwell being about 24 ft. beneath the engine-room floor. This floor is about 78 ft. above the Vermillion River so that the circulating water will act against a 47-ft. head. At first, the advisability of digging a 60-ft. pit beneath the engine-room floor for these condensers was considered. This would have reduced the necessary lift of condensing water from the river, disregarding syphon effect, to about 18 ft. However, after some consideration it was decided that the saving would not capitalize a sufficient amount to build the pits and tunnels. It was also thought that the maintenance of condensers in such an inaccessible position would be unduly difficult and would probably be less satisfactory because workmen would prefer not to work in the hot subterranean pit. It was also thought that with the condensers at this low level sufficient circulating water might not be available in periods of drouth. To meet this latter contingency, however, the company intends to build a concrete dam across the river, and with the condensers at their present level the circulating water can be returned to the upstream side of this structure, cooled and used again.

Boston Service Complaint Dismissed

The Massachusetts Public Service Commission has dismissed the complaints of the boards of aldermen of Medford and Somerville, of the city council of Woburn and of the Everett board of trade upon service conditions at the Sullivan Square terminal of the Boston Elevated Railway. The petitioners claimed that the system of elevated train operation at Sullivan Square gave passengers from Malden and Everett an unjust preference over passengers from Medford, Somerville and Woburn. By an order of the Railroad Commission in 1912, the company arranged the operation of its trains at this station so as to permit passengers arriving at the upper or elevated train level from the Malden and Everett districts to board, from the platform previously used for unloading only, such trains as are to be operated around the loop and back into the city of Boston. A three-month trial of this plan convinced the board that the rearrangement of service did not constitute an unjust discrimination, but was necessary in order to give the Malden and Everett passengers facilities at the terminal more nearly equal to those enjoyed by the Somerville, Medford and Woburn passengers. The arrangement has since been in force, and by its means passengers from all points served by upper level cars have been placed on a substantially even footing with respect to the distance necessary to cover in transferring between cars and trains.

Complaint was also made by the petitioners in regard to the crowded condition of cars operating to and from the terminal during the rush hours. In order to relieve these conditions, the company is, in compliance with a suggestion of the board, operating a large number of cars upon its trains over the elevated structure and through the Washington Street tunnel, and is running these trains during certain morning and evening hours as frequently as conditions of safe operation will permit. The board, in dismissing the petition, calls attention to this increased service and points out that the completion of the extension of the Boston Elevated Railway to Everett and Malden will further relieve the congestion of traffic during rush hours.

Papers at the New York State Convention

Abstracts Are Published of the Papers Presented at the Bluff Point Convention by Messrs. Hoey, Gonzenbach, Barnes, Witherwax, Bagg and Sawyer.

EMPLOYEES' ACCIDENT INSURANCE

BY JAMES J. HOEY, SECOND DEPUTY SUPERINTENDENT OF INSURANCE OF THE STATE OF NEW YORK

Employer and employee in this State will assume a new relationship towards each other after July 1. It will be a relationship unclouded by the fear that has always hung over both when there existed the likelihood of injury to the workman and doubt as to the extent and character of the compensation he was to receive.

DEFECTS UNDER FORMER SYSTEM

The old employers' liability law served as an instrument for the creation of mutual distrust between employer and employee. The charge of negligence always brings with it reflections on the person guilty which he is likely to resent. In as much as the employee was obliged to prove not only negligence on the part of the employer but also the absence of negligence on his own part, the question of negligence became a double instrument for the creation of distrust and irritation between the parties.

This distrust and irritation was accentuated by the insurance companies. The employer did not insure his workmen under the old law. He simply insured himself against damage on account of negligence. The insurance companies which undertook the defense of suits had no interest in the future of the injured workmen. They were concerned only in protecting themselves against verdicts, and they employed high-priced lawyers specially versed in negligence law for the purpose of defeating any and every claim presented. These lawyers had but one point of view, the protection of their clients by the extreme exercise of their technical legal skill. To offset the conduct of insurance companies, buttressed by such expert legal skill, the injured workman was obliged to put himself in the hands of other lawyers of equal skill and competence. Consequently, the system of contingent fees sprang up, and in as much as the workman's lawyers could not be paid unless he won his case, the misfortune of the injured man became a pawn in the legal game between two expert attorneys, each concerned only with the question of whether he would win or lose.

Under such a system the old relationship of confidence and friendship between employer and employee was bound to disappear. The employer, instead of looking upon his workmen as wards who needed his protection and assistance, came to regard them in many cases as vultures awaiting the opportunity to pounce upon him as prey, while the employees, on the other hand, grew to look upon the employer as a heartless personage without any regard whatsoever for their welfare or protection.

With the constant creation of legal entities known as corporations to take the place of real personalities as employers, this condition was bound to increase. It was aggravated further by the constant disposition of all classes in this country to do things under high pressure and without regard to the best care and circumspection—a disposition which in recent years has been so much identified with what is known in the United States as progress.

It did not improve the temper of the workman to learn that his claim for damages might be defeated by any one of three defenses, viz., the assumption of risk, negligence of a fellow servant or contributory negligence on his own part. Nor was it consoling to him to know that, even if he had surmounted all difficulties and obtained a verdict, half of his award or more was to go in payment for the skill which his lawyer exercised in winning the case. Economists are puzzled when they attempt to explain why the workmen have been compelled to assume all the risk of their employment and why, because of that hazard, workmen's children are exposed to the danger of becoming public charges. It seems certainly more rational, more economical, to have the cost passed on to the public in the first instance. There is no more reason why the risk assumed by the mechanic while working on a building should not be paid for by the owner of that building than that the time consumed in the making of the bricks for the building should not be paid for by the same owner.

FOREIGN PROGRESS

It is hardly creditable to the United States that Europe is so far ahead in the practical work of providing compensation for workmen's injuries. Germany passed a workmen's compensation act in 1884, and twenty-six countries of Europe have since done the same. The schemes adopted were as varied as the countries adopting them, but the underlying principle was the same throughout. Whether compensation was provided through mutual associations, as in Germany, and Austria, through direct obligations, as in England, through private insurance companies guaranteed by a state fund, as in France, through a combination of both kinds, as in Sweden, or through a state monopoly, as in Norway, the European workman has for years been enjoying the sense of security which the workman of New York will have after July 1.

WORKMEN'S COMPENSATION IN NEW YORK

The fact that New York has not had a compensation law in operation until now, however, has not been the fault of modern enlightened public opinion in this State, because it was the first to adopt a scheme of compensation insurance. This, because of the disposition of the Court of Appeals to interpret superstrictly constitutional provisions that were never intended to apply, was declared to be incompatible with New York's constitution. It has taken five years to correct the defect, and meantime New York has been distanced by Massachusetts, New Jersey, Illinois, Michigan, Washington, West Virginia, Oregon, Nevada and a number of other States, which have adopted as many schemes of protection as there exist in European countries.

It is unnecessary to repeat the history of the efforts to procure a workable workmen's compensation law for this State, of the contest between the labor unions committed to the creation of a State monopoly on the one hand, and those agencies which did not believe the State could successfully undertake such a scheme on the other. The contest, however, resulted in a compromise measure, largely through the influence of Governor Glynn, embracing the best features of both systems but paying to the workmen greater compensation than is paid by the system in force in any other State.

Inasmuch as Governor Glynn was largely responsible for the passage of the law, he deemed it wise to follow its operation closely. Perhaps no five men better qualified to administer such a law could be picked in the State than those selected by Governor Glynn to compose his compensation commission. Robert E. Dowling, whose name stands for business and constructive progress; John Mitchel, whose name is synonymous with the requirements and the progress of enlightened labor; Mr. Darlington, New York's greatest health commissioner; Professor Mosher, educator and lawyer, and J. Mayhew Wainwright, legislator, whose name is identified with the first commission that evolved a compensation scheme for New York. The task which each has to accomplish is difficult. To comprehend, digest and assimilate the variety of actuarial, engineering, manufacturing and administrative questions which will come before them, and to pick out the defects and ambziguities of the law as it stands, whip the corrections into shape and give them concrete expression by the beginning of the next legislative session, is a task calling not only for application and energy but also for constructive ability of the highest order.

MEDICAL SERVICE

The workmen's compensation law provides not only for damages on account of injuries but also for medical service for injured employees during the time of disability. It is refreshing to see that the great organization with which your president, Mr. Hedley, is identified has taken the initiative by providing in advance for this important service. The Interborough Rapid Transit Company has arranged with doctors and hospitals for the care of its injured employees. It has also worked out a scheme which bears the ear-marks of care and study. When a man is injured he reports at once to the first-aid man, a fellow employee, at a terminal shop or power house. It is this man's duty to give the proper first-aid treatment, and then send the injured man either to a local doctor or, if the injury is trivial, back to his work. If further treatment is needed, the employee continues to visit the doctor as often as necessary, and if necessity arises he is sent to a hospital. In the hospital he does not become an ordinary ward patient but is sent to the semi-private ward where he can see friends and relatives at reasonable times and where he does not have to incur the stigma that attaches to a charity patient. If his injury requires special treatment, he will obtain the services of a specialist. At the central hospital massage, baths, electricity and the like will be provided to treat those who have become victims of rheumatism or other ills common to the workman who is exposed to the weather. All these go to make a strong link in the magnificent scheme for the conservation of human life.

RAILROAD ACCIDENTS

The country is now entering on an era of economic conservation of life and property. With the confidence of a young giant, we have been prodigal of our strength, unmindful of the fact that some day that strength might be dissipated. We are waking up. We are realizing that this waste of life and property cannot go on indefinitely, if our future prosperity is to keep pace with our prosperity of the past.

Yet while science has been searching out and destroying the older enemies of man, invention has not provided safety appliances to keep pace with its own creations. The number of accidents on American railroads is a by-word of Europe. Every man injured by a railroad and improperly compensated becomes an agent of discontent among his fellow men, with whom the railroads in the last analysis will have to reckon. Every inadequate piece of rolling stock becomes a piece of evidence in the indictment against efficiency. Every unprotected mile of roadbed makes for the propagation of the spirit of ill-will towards the company that maintains it.

To accomplish safety, to bring it to its highest state of perfection, organization is needed. The schools also must be utilized, and the young people taught what to do and how to do it in order to protect themselves. Yet a higher duty devolves upon the railroads, a duty which must find its practical expression in the adoption of the most up-to-date methods of safeguarding life and limb.

The disposition of woman, for example, to use her right hand in alighting from a street car, acquired congenitally through a long line of female ancestors who did sewing and household duties with their right hands while their lefts were practically neglected, cannot be corrected in a day. You cannot correct this disposition by any number of educational pictures. The trouble is too deep for such a superficial remedy. The evil can only be obviated by providing a means which makes the use of the right hand under the circumstances unnecessary or impossible, and by instituting a radical and thorough system of education. You can begin with the young girl in school. You can train her to acquire proper habits; you can teach her how to use her hands in order to protect herself. But the process of education has to be undertaken before the habit predicated on a natural tendency is acquired.

EDUCATION OF EMPLOYEES

The most necessary of all educational work, however, is the education of your own employees. Every motorman, every conductor, every trainman is familiar with the causes of accidents. Many of them have worked out in their own minds methods by which these accidents should be avoided. Experts tell us that only 15 or 20 per cent of the accidents caused by machinery can be prevented by the adoption of mechanical appliances. It follows, therefore, that if we are to cut the number of accidents in half, the remaining 30 or 35 per cent must be prevented by means of education.

In the old days conductors and other employees of railways received bonuses based on the amount of their collections and the time made on each trip, and more recently they were rewarded for their economic use of electricity. In the future they will get rewards for minimizing the number of accidents. Such a system has been established by the United States Steel Corporation and remarkable results have flowed from it. Each mechanic is given to understand that every scheme of safety he invents to make the operation of his own machine safer is going to be recognized by the payment of periodic bonuses for the prevention of accidents. By this means each mechanic's talent for invention or adaptation is stimulated and the company has the advantage of all this otherwise undiscovered talent, perhaps genius, which it pays for only after results have been accomplished. The stimulation of this talent improves the mind of the workman, creates a stronger binding tie between him and the company, saves him from dangers to which he would otherwise be exposed, and protects his family and the company, which would suffer an economic loss were he to be replaced by an inexperienced and untrained man.

This is a plan which steam railroads and electric railways can copy with advantage. New trainmen should be trained in a well-equipped school maintained by the company. Their latent talents should be de-

veloped, their suggestions heeded, their schemes put into practical effect, and, if the scheme prove useful, the members should be remunerated.

It is the general impression that the companies have heretofore acted on a wrong theory in their dealings with the public. Stockholders have been greedy for dividends, officials hungry for large salaries. For that reason the trainman was paid a minimum wage and was instructed to bring his car in on time irrespective of public safety, injuries meant only lawsuits to be defended to the last ditch, old equipment was maintained long after safer and better kinds had been evolved and long after it had been demonstrated that the adoption of the safer and better kinds would mean an ultimate saving to the company. Safety, however, is going to be the watchword of the next decade. Safety is economy. The railway which does not adapt itself to the new idea will run the risk of having its property condemned and turned over to public ownership and operation. The country is not ripe for this step, but the public is sometimes impatient. Such impatience can be controlled by good service by the companies and in no other way. Good service means safety to the public and to employees.

A PLEA FOR MUTUAL EMPLOYERS' LIABILITY INSURANCE

BY ERNEST GONZENBACH, GENERAL MANAGER EMPIRE UNITED RAILWAYS

Knowing that I have been living in the State of New York less than three months and am not yet really established solidly in my new work, it seems to me that I was somewhat presumptuous in accepting this invitation to discuss the subject of employers' accident insurance. Nor have I become as yet familiar with the details of the New York compensation law which became effective on July 1. Therefore I will not pretend to discuss the merits or demerits of the law as it stands on the statute books. My object is to make a plea for mutual insurance, and the subject has been assigned to me presumably because I have just recently passed through the experience and ordeal of operating a public utility, with all its advantages and disadvantages, under a workmen's compensation law.

For a number of years past I have been located in the State of Wisconsin and that State passed a workmen's compensation law which went into effect on Sept. 1, 1911. In order to understand clearly my viewpoint as to mutualization of risk, it will be necessary for me to give you a short summary of our experiences in the State of Wisconsin. At the time the law was before the Legislature all the manufacturers and employers generally very bitterly fought it but did not succeed in materially changing its provisions, and when it became effective it was by many considered a detriment and a burden on the industries of the State. This view was still further intensified when we received the stock liability insurance companies' new schedule of rates covering risks under the workmen's compensation law. The rates for all classes of employees were increased in prodigious amounts, but particularly was that the case in the public utility business. A few months of actual experience under the compensation law soothed our ruffled feelings, and I think I am safe in saying that a large percentage of employers found that settlements under the new law were more satisfactory to both employer and employee. On the whole the law has won much favor. The New York law is more drastic, I am told, than the Wisconsin law and its administration, it is feared in some quarters, will give cause for some dissatisfaction. However that may be, I can only wish for the New York law the level-headed and fair administration which has made the Wisconsin law a success and a source of great satisfaction to both sides. May the New York law be equally detrimental to the shyster and the ambulance chaser.

The manufacturers of Wisconsin found their way out of the dilemma by organizing the Employers' Mutual Association, which has been working successfully and to their great advantage. It is one of the best-administered concerns of its kinds. The public utility operators, and particularly the electric light and electric railway people, were not in as fortunate a position. For one thing, their rates had been increased in proportion greater than that of any other class of employers. Electric lighting employees were increased 124 per cent, city street railway employees were increased 650 per cent, and interurban employees 1100 per cent. This increase was partly due to the fact that up to 1910 the liability insurance companies had been actively soliciting business and competing in rates, whereas shortly after that a uniform scale was established and the percentage of increase as compared with this uniform scale would not appear quite as large. Stimulated by the comparatively low rates and good service which competition had forced onto the stock companies, few companies had attempted to carry their own insurance, and the sudden rise in rates therefore seemed all the more a burden and threatened to wipe out the all too slender balances of many a company. The consequence of the prohibitive rates naturally was that most companies cancelled their liability insurance as fast as policies expired, preferring to carry their own risk. But the stock companies had another trump card in their hand. While it has never been possible for electric railway companies to get public liability insurance, such insurance has been issued regularly to electric light companies, and almost every electric light company carries such a policy and considers it essential; in fact, such public liability insurance in electric lighting companies is much more important than employers' liability insurance. When the electric light companies of Wisconsin began cancelling their policies the stock companies refused to issue public liability policies unless the companies also carried employers' liability. This was a club held over the head of the smaller companies which forced many of them to accept the very high rates of employers' liability insurance, which they paid in preference to losing liability insurance altogether.

Confronted by this situation the Wisconsin Electrical Association appointed a committee, of which I had the honor of being chairman, to find a way out of the difficulty. After a year's deliberation and a great deal of discussion it was decided that the electrical companies in the State form a mutual insurance company, the administration of which was to be in the hands of the Employers' Mutual Company, formed by the manufacturers of the State, and which would be administered by that company and the cost of administration pro-rated on the basis of cases handled and compensation paid. The electric companies, however, were to form a separate and distinct class with their own reserve fund, and we were in no way to participate in either the risks or profits of the general funds belonging to the manufacturers. The administration of the fund was to be in the hands of the electric companies entirely. The point of advantage of this arrangement is in the fact that while manufacturers and electric companies each carried their own risk, the cost of administration and all overhead charges were shared by a larger number of risks, with consequent reduction of the unit costs. So far as I know this plan is being

put into effect now. In view of the situation now confronting the electric railway industry of New York State I believe that I have been justified in mentioning the experience of the Wisconsin association here.

The general tendency among the larger companies in the State of New York seems to have been to declare their intention of carrying their own liability insurance, under the State law which went into effect on July 1. In view of the large size of the companies which make up the majority of operating properties in this State this may be the best policy. There seems to be no doubt whatever that the employers' risks involved in the street railway business are very much less than they are in most manufacturing interests, or than they are in contracting and construction work. Furthermore, the element of general risk in the street railway business is naturally very great and is infinitely greater in the case of the public than it is in the matter of injury to employees. Employers' liability is a small fraction indeed of the risk which every company in the railway business incurs and carries continuously. Many companies ignore employers' liability entirely, and this justly so when one considers the enormous risk in public liability which the business involves. This, however, it would seem to me is only a further argument in favor of mutualization. Under the new law we must, if we carry our own insurance, provide a reserve in funds for carrying this insurance, or we must pay rates to stock liability companies or to the State which, in the opinion of most of us, seem exorbitant and higher than the risk warrants. Is there not reason why we should share this fractional risk involved in the carrying of our employers' liability?

THE OPPORTUNITY FOR CO-OPERATIVE INSURANCE

We have for many years been talking of co-operation in the electrical fraternity. We have an Electrical Development Association which is continually preaching to us "co-operation." We have committees of various national associations which have presented the subject of co-operation before their respective bodies, where the slogan has aroused much enthusiasm. We have an electrical secret society and it is no breach of obligations to disclose the fact that their principal object is co-operation.

We are now confronted by an opportunity which enables us to put into practice the many nice things we have said about each other and the many good deeds we have promised ourselves to do. This opportunity comes to us through the possible mutualization of employers' liability risks. By sharing our risks it is, of course, within the range of possibilities that we may assume some risk slightly greater than ours, judged on the basis of past records. However, very likely the other fellow thinks that he is assuming a greater risk by going in with us. I do not believe that a past record is altogether a criterion on which to base liability risks, for it is a well-known fact that many a road having an absolutely clear record covering a period of years has suddenly met with a series of accidents which proved exceedingly burdensome and costly. It is an axiom in the insurance business that the larger the distribution of the risk the greater safety to the insurer.

There is not one company in a hundred which feels strong enough and able enough to carry its own fire risk. Any company which does so, carries its risk at an expense in capital investment and reserve fund which is jealously guarded and of a sum ample to cover possibilities. We have splendid examples of mutualization in risks in the fire insurance business. There is not a better class of insurers than the Senior Massachusetts Mutuals. One of the stock arguments urged against mutual fire insurance companies and mutual companies of all kinds is the fact that the risk is distributed over too small a number of individuals. Such an argument would have no bearing whatever in the case of employers' liability insurance which we are now discussing because we are insuring a small part only of the risk which each company carries individually and must continue to carry. If fire insurance in stock companies is a good thing, then employers' liability insurance in stock companies is a good thing; if fire insurance in mutual companies is an accomplished and successful procedure, then employers' liability insurance in mutual companies can be made so, and it would seem to me that there is ample talent and financial power among the railway operating companies of New York State to organize and administer a mutual employers' liability insurance fund in such a way that ample justice will be done and that fair rates will be charged. Mutualization in New York is further facilitated by the fact that the State assumes the cost of administration of mutual funds for a period of two or more years. The companies I represent have had an exceptionally clear record in carrying their own employees' risks. We do not hesitate to continue to carry our risk under the new law, but we stand ready to help along the cause of mutualization and would be glad to see a mutual organization established to carry the workmen's compensation liabilities of the electric railways of New York State.

ACCIDENT PREVENTION

BY JAMES P. BARNES, GENERAL MANAGER SYRACUSE & SUBURBAN RAILROAD

The subject of accident prevention is too vast for any one paper, or any one discussion, or even, it would seem, for any one volume or library of volumes. It is, therefore, to one phase only, and only one side of that phase, that we must address ourselves. The recently enacted workmen's compensation law of New York State is, in essence, the culmination of a series of attempts to reconcile cause and effect in this matter of accidents and their resultant effects and to transfer from the individual to the industry itself the burden of accidents incident to the conduct of that industry.

Fundamentally our question of accident prevention reduces itself to terms of industrial improvement, more particularly safeguarding. As the public mind to-day is so engrossed by the matter of accidents to employees, it would seem pertinent to direct our discussion to the prevention of this particular kind of accidents, in other words, to the safeguarding of an industry with respect to its employees rather than to the public which it serves.

Usually criticism is ill-advised and unwelcome unless it is constructive in character. The various laws under which the remedy of hazardous conditions has been attempted have been critical and have, in the main, aimed at constructive measures in such matters as safeguarding of machinery and the like. It has been and still is all too true that the employer, generally speaking, has resisted the enforced installation of various safety devices, calling for an outlay of capital and in some cases a slowing down in the rate or reduction in the amount of output. Many an employer is not big enough to see over the top of his payroll, or broad enough to see around it. Upon him the broad humanitarian aspect of the situation is lost or distorted.

But it is the fact and not the theory with which we have to deal; it is the operation and not the inception of the various so-called "labor laws" which concern us in this discussion. Looking back over the years to the time before the injection into the laws of the words "compensation" and "liability" we see a definitely marked tendency toward the standardization of condi-

tions in the shop and factory through the activities of the State labor department and particularly the bureau of factory inspection. This standardization took the form of compulsory guarding of woodworking machinery, punch presses, belts, gears and similar equipment, together with the installation of signs of various sorts designed to promote safety of operation and prevent panic from various causes. Much of this work was good and of a real constructive character, but to one tendency of it in particular I desire to direct attention. As the various safety devices multiplied and increased and were installed under compulsion, often in direct opposition to the will and desire of the workman himself, the individual most affected, the tendency grew to disregard the human factor still further—to say under any set of conditions "do thus and so," regardless of surrounding conditions which were often fundamentally different. Yet these conditions were frequently the determining factor in the success or failure of the particular device or method.

It is an axiom that an unguarded machine, with a careful operator, is much safer than a guarded machine with a careless or incompetent operator. It is equally true that many careful and reliable operators find the liability to accident actually increased by the addition of guards, which are often cumbersome and inconvenient and which sometimes in themselves constitute a very real hazard.

Of these things our laws have taken no cognizance, saying in effect, "A workman is a workman and must be protected always and in the same manner, regardless of what his qualities are as an individual." I wish to call attention to this tendency of the operation of our laws without over-emphasizing it and, at the same time, without minimizing its importance. Standardization of conditions is on the march and the vanguard has already arrived. Therefore let us waste no time in idle discussion of its merits, or demerits, but study rather how best to meet those conditions that are with us as well as those that are surely approaching.

Accidents are accidents only in name. An accident is a perfectly logical and proper result of some particular cause or set of causes. Every accident is a logical succession of cause and effect, and in this sense no accident happens accidentally. Now, any effect which is the result of a definite cause or causes can be controlled if the causes can be controlled. Our remedy, then, is to seek the causes of our industrial accidents and to remove or modify the causes, so that they will result not in that undesirable effect that we call an accident, but in that desirable effect which we call safety.

Remembering that we are dealing here with the industrial accident, or more specifically with the accident in which the employee rather than the public is the victim, we can definitely fix the cause of a large percentage of such accidents under the general heading of "carelessness." The cause may be the carelessness of the injured workman himself, or of his fellow workman, of a bystander (especially is this true in out-of-door work), or of the supervising officer or employee, but, broadly, if everyone concerned were thoroughly careful, most of the accidents of to-day would be avoided.

In this one matter of carelessness lies the most prolific cause of accidents, and the trait of carelessness is fundamentally a part of the human character. Everybody is careless to some extent about some things. Eliminate carelessness and you have eliminated the larger proportion of all accidents by the one means.

Our analysis then brings us to the conclusion that by far the most prolific cause of accident lies in the action of that group of forces which we describe as "human nature." Does the problem then become one of altering human nature? No; rather of redirecting the forces and bringing their action to bear along different lines and to different results than the present methods evoke. Philosophers have remarked, and no contradiction has yet been very successfully offered, that human nature is pretty much the same whenever and wherever you find it. Since we have then an old and well-established force to deal with, one which tends to proceed pretty much along the same lines on successive occasions, it is obvious that we must change the surrounding conditions in order to change the result in as much as we cannot change the actuating force.

Consider for a moment the action of the body that has been most conspicuous, perhaps, in the reduction of industrial accidents in recent years, the United States Steel Corporation. Conspicuously located at the Gary plant of the Illinois Steel Company is a stereopticon flashing such warnings as "Remember it is better to cause a delay than an accident." Exhibits of unsafe tools taken from the hands of workmen form a conspicuous part in this company's plan of campaign. Safety devices and guards on and about machinery have also formed an important part of this campaign, but personal attention to the little matters of safety, as well as the large ones, has played a most important part in attaining success.

Our most important and essential problem in dealing with these matters is that of reaching, and reaching in the right way, the personality of each man on the working force. Primarily men must be careful, careful for themselves and careful for others if real results in accident elimination are to be obtained. Different men are of different minds and open to different manners of approach, and the successful preventer of the industrial accident will be he who studies, knows and wins the confidence and loyalty of his men.

Incidentally many other good things will accrue to the credit of the man who scores in the prevention of accidents because the loyalty, good-will and co-operation which form the basis of successful accident prevention form also the basis of economy and efficiency in the every-day routine of operation.

Good will feeds upon good will and grows larger and stronger thereby. When the millennium arrives that plant or business which shall bear the designation "successful" will also bear as conditions precedent to that success the designations, "square, upright, careful and humanitarian."

EFFICIENCY

BY CHARLES J. WITHERWAX, GENERAL PASSENGER AGENT SCHENECTADY RAILWAY

Efficiency that has assumed sufficient proportions to make it perceptible in service rendered to a critical public is undoubtedly the result of that kind of influence that makes for co-operation and a desire to serve. This cannot be contained in one man but must be persistently permeating the various departments of an organization from top to bottom. A combination of men, imbued with a spirit of responsibility to their employers and the public they serve, will quite readily develop sufficient energy and leadership to overtake at least the reasonable demand now being made for greater efficiency.

The successful railway managers and operators are those equipped with powers of discernment, not only in stock, bond and dividend values, but in the signs of the times. The growing man cultivates his job, has constructive curiosity. He reaches out in all directions for information and capitalizes it for practical purposes. He realizes that these are days of investigation and explanation. With his broadened view he has

almost obliterated departmental independence, for he feels that true efficiency demands that the component parts of an organization have the same common tendency. If he is observant, he soon discovers that a rule is not a rule but a reason. He often substitutes application for vacation, or uses the vacation as a means and not an end. Men as well as nations show better results from continual application, efficiency being lost in too much relaxation.

Efficiency is not a career. It is a cheerful, mental and moral feeling of obligation towards a given end. In the passenger department of an electric railway it is that kind of attitude that begets business and favorable comment, which means more business, turning verbal brickbats into nickels. This applies to every department of railway business, but especially to the transportation department, because that department furnishes by far the greatest number of points of contact with the people served. It must be remembered, however, that one can sometimes stand too near the woods to see the trees. He must go to the hilltop to get a good perspective. I have sometimes wondered whether men in the train service might not be standing too near themselves, thereby missing the real view and the many opportunities which they have to distinguish themselves for personal efficiency and regard for the company's interests.

Building and operating a railroad involves great risk. Rails once laid cannot be taken up except for betterment, and no railroad that is not making money can be sold except at a sacrifice. Men capable of inaugurating such enterprises and carrying them to successful conclusion must have knowledge of the past, discernment of the present and imagination of the future. Their executive ability depends upon their power to have their work well done by others. The greatest difficulty is in the prevention of economic waste, one of the largest items of which is the supervision made necessary by carless employees.

EFFICIENCY

BY W. H. SAWYER, VICE-PRESIDENT E. W. CLARK & COMPANY MANAGEMENT CORPORATION

The term efficiency, as it is generally used to-day, means, as I understand it, a maximum of result for a minimum of effort. The scientific theory of practical efficiency is as sound as science itself, but as in all such movements one particular industry, such as the electric railways, must take only that which is practical for its own conditions. Efficiency as it has been applied and is being applied to electric railway management and operation, and as I shall speak of it to-day, is efficiency born of stern necessity—efficiency which has been compulsory in order that our electric railway systems might survive and exist—efficiency which is still compulsory, still a necessity. As applied to electric railways, efficiency is, to my mind, what you and I know as good management—nothing more, nothing less.

During the period from 1902 to 1912, the efficiency of electric railway operation increased to an extent that would not have seemed possible, let alone probable, ten years ago. The cost of living during this period has increased, say, 40 per cent, coal has increased in cost, say, 20 per cent, and taxes several hundred per cent. The revenue passengers carried by street railways have increased approximately 100 per cent, while the transfer passengers have increased approximately 143 per cent. During the last five years, with large and efficiently operated companies, the costs of operation of the power plant and the costs of injuries and damages show the greatest decreases. Maintenance and platform wages show the largest increases.

Possibly some of us have this efficiency idea too strongly in our minds. Efforts toward efficiency must and should be based on cold-blooded business. True efficiency means net saving, taking into account all things of to-day, to-morrow and hereafter, and the efficient manager proceeds slowly and cautiously. He knows that the expenditure of good money should not be made until he is reasonably certain that the new expenditure is warranted, after taking into account the financial resources of the company as well as the fact that many claims which look well on paper do not help to pay interest on investment, let alone dividends. Let me state that old truism to the effect that even a poor manager may show a good operating statement if furnished with sufficient new money, but that the best managers are those who, with a minimum of new money, produce satisfactory results, and this is especially true to-day, when the primary thought should be to conserve present investments.

Our efforts must be to make the best possible use of existing equipment before we figure the saving on new equipment. Efficiency methods as generally understood should be conservatively and cautiously dealt with, for the margin for error in electric railway problems is so slight, if it is not actually a minus quantity, that before proceeding along radical lines we must make more than reasonably sure that the net effect of the change is for the better.

The efficient manager spends, but he spends wisely. Economy is not necessarily efficiency, and buying second-hand or lower-quality material or laying off men is often not even economy. It is poor economy to rewind an armature and then put it out in service without a high-potential test. It is efficiency to attend to maintenance and repairs when needed—not before and not after.

The question as to what percentage for fixed charges and profit justifies expenditure of money depends first of all on the certainty or uncertainty that the estimated percentage will be really saved. The manufacturer generally sees to it that the savings are all included in the estimate. We must all experiment to a certain extent, but not without first thoroughly appreciating the possibilities of the results of the expenditure. A new device that looks and reads well may, if bought to-day, have to be superseded by a different one five years from now. This, if true, means 20 per cent for supersession alone. The electric railway owner is not looking to-day for ways to spend more money, except as such expenditure is necessary to protect or better present investment. Generally speaking, any new device must show at a minimum at least 20 per cent for fixed charges and profit, and unless one can see estimated profits at least twice as much to justify the expenditure, the safer rule is to do without the expenditure.

Efficiency is, of course, relative. When we fall below the average of comparative companies, we cease to be efficient in the true sense of the word. The pace set in the electric railway industry is a fast one, necessity is ever present, and he who is truly efficient must lead and not follow. It is not true efficiency to have any one department far below par, even if the property as a whole is up to the average. Moreover, the man and the company are often judged and criticised for its weakness, and true credit is generally not given to those departments that are above par.

Definite, correct, detailed, analytical, comparative records are not useless red tape, although even these may, of course, be overdone by needless detail and com-

plications, but without such records no official can hope to be efficient. It is by means of these comparative records that the weak spots can be found and given thought to, until the once weak spot is eradicated, with always, of course, others needing attention. The records must be so carried out and analyzed in detail that the weak spots in the operation are clearly apparent when fair comparisons with previous years or with other companies are made. It is not enough to know that maintenance is higher than it should be; we must know just what details are high before we can correct the cause.

It would not be fair to stop on this question of efficiency after simply reviewing the past and the present and pointing out the necessity for further efficiency. The real question is, in what way can we, from now on, do the most that can be done to make our electric railways more efficient? I can but bring home to you the old answer, though it was never more appropriate than now. Individuals can do their best, can give their very heart's blood, as it were, to the detailed problem, but the greatest good to the greatest number is brought by efficient co-operation—co-operation of local employees by company sections, formal or informal—co-operation between groups of companies, as illustrated by this association—co-operation between all of us, company employees, company officials, manufacturers, engineers, technical press, and the multitude of others all interested in electric railway prosperity.

The electric railway associations are working along proper lines in their endeavor to co-operate with the public for the benefit of the public and of an industry whose continued prosperity and advancement is necessary for the public good, and with the vast amount of efficiency work that is done to-day by the larger companies—with the many reports and papers on the subject—I believe that the greatest cause of inefficiency to-day is that we do not take full advantage of the efficiency of the other man or the other company. If there is one thought more than another that I want to strike home this morning, it is that of the efficiency of co-operation, and, in order to get this, we must keep in detail comparative records and use them to continually check ourselves against the other man. The electric railway industry needs our best endeavors, and these cannot be given efficiently unless all of us, individually and collectively, co-operate through our electric railway associations.

EFFICIENCY

BY F. A. BAGG, CHIEF ENGINEER FONDA, JOHNSTOWN & GLOVERSVILLE RAILROAD COMPANY

Efficiency as applied to railroads means in our minds the managing of the properties and the carrying on of all of the work of the different departments in as economical a manner as possible, and by this means showing a favorable operating ratio and producing as large dividends as the property is capable of. This we have always supposed meant efficiency, and it has not occurred to most of us that there could be any other kind of management. Within a few years, however, the normal progress of civilization, together with the economic needs of the times, has brought into prominence a new idea, a new interest called scientific management.

[Mr. Bagg then outlined the fundamental principles of the Taylor system and referred to the writings of C. B. Going, Harrington Emerson, Frank B. Gilbreth and F. W. Taylor. He also described briefly the "unit system" of management, devised by Major Hines and used during the past few years on a portion of the Harriman lines. He also mentioned the criticism of the steam railroads for their waste of labor and materials, resulting in low efficiency.]

If it is true that there is such waste on steam railroads our electric railways may well be suspicious that there may be waste not now apparent that might be saved by the adoption of some new ideas of management. According to Mr. Emerson we should search for such waste in the labor and material accounts.

I have no complete and ready-made plan to offer that can be "clapped on" to any electric railway and which will show a marked decrease in the operating ratio in the next annual report. During some years of employment on public works and steam and electric railways I have, however, observed some conditions that appeared capable of improvement.

In the first place, any new plan must come from the top. Subordinates are apt to believe that suggestions and much initiative are not usually encouraged, hence the whole organization should be given to understand that the higher officials are ready to encourage anything that will stop waste and increase efficiency. The ignoring of such suggestions as those relating, for example, to the location of a power house with respect to high water, to the proper width of a roadbed, to the proper angle of slope in cuttings, to the best location of a portion of track, etc., is always costly to a company.

The management organization should be so complete, or should be made so by the addition of the necessary staff officers, that the work in all departments can be thoroughly covered and ample time afforded for studies and investigations designed to increase efficiency. Every year the railway and allied associations gather a great deal of valuable material, make recommendations and prepare standards, of value if followed. The regular line officers whose time is taken up with routine work may or may not be aware of these recommendations and when they do it may require special effort to convince the management that the recommendations should be adopted. The proper way is to make it the business of some one or some staff to investigate and determine from time to time those improved methods or plans which are worth taking up.

Why is it that private individuals and contractors can do work or conduct business cheaper than can a railroad or other large corporation? My observation shows that successful contractors have the best equipment and well-paid assistants who work under the concentrated attention of the contractor himself. Often the railroads cannot have as strong construction or maintenance organizations because they must get along with inferior or insufficient equipment. Fewer superintendents and foremen are sometimes provided and they are paid less for their work. This is not true with the labor item when the restrictions are removed. The saving in poor supervision is more than lost in the larger payrolls. A contractor told me that he wants his foremen to spend a dollar whenever they can save two, but this is not usually the case with railroads.

Two illustrations of the application of the last-named principles may be of interest. In one case a railroad secured very great improvement in track maintenance at low cost by a 25 per cent increase in the track force. In another case an expenditure of $2,700 in eliminating defective bonds saved $3,700 in the power bill in two years.

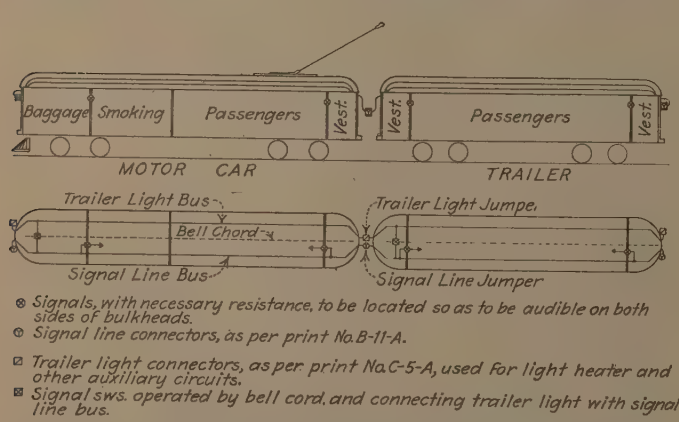
Consider the application of the principles of better management to the case of the maintenance of way department of an interurban line. This work is often done after a fashion followed for years. A good practice would be this: As spring arrives shims are removed, the track is fixed up where necessary and new

ties are put in here and there. This work should be finished early in the summer. Then come mowing, weeding, ballasting, lining and surfacing, and later ditching and preparation for winter. On how many lines is such work done in accordance with a well-planned schedule and under the complete and constant control of the track supervisor? Too often the decision as to the number of ties is left to the guess of the section foreman and cut arbitrarily. During the period of tie replacing the track supervisor can save his wages by preventing the removal of ties still good for a year or two. All ties should be in by a certain date, say July 1, and the track ready for summer traffic. A schedule should be prepared in advance for the season's operations and it should be rigidly adhered to. The track supervisor should be on the line constantly, keeping the track gangs up to schedule and following up and remedying the causes of delay. In the fall the tie requirements for the following year should be accurately determined to insure prompt delivery. This procedure would result in better control of maintenance work at less cost.

Proposed Standards of the Central Electric Railway Association

At the convention of the Central Electric Railway Association held in Toledo last week the report of the standardization committee presented a number of important recommendations. These were given in abstract in the Electric Railway Journal for June 27, page 1454. Details of the recommended changes are now available. As reported in the account of the meeting, the report of the committee on standards was accepted as presented by the committee and the secretary was ordered to send copies of the report to the individual members of the association for final action at the next meeting. This will be held in Indianapolis some time in November, so that ample time is afforded for consideration of the recommendations.

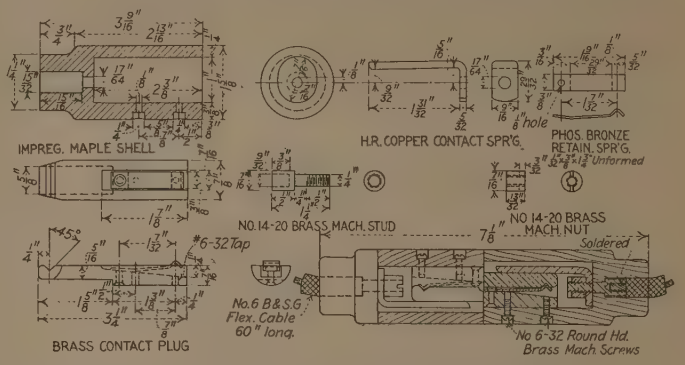
In its report the standardization committee recommended the adoption as "recommended practice" of the standard 6-in. trolley wheel which was tentatively submitted before the association a year ago. This wheel is 6 in. in diameter over all, has a hub 1¾ in. long and has a groove with a maximum width of 1⅛ in. and a minimum width of ½ in., the depth of metal at the bottom of the groove being ½ in. A drawing of this standard trolley wheel was published in the Electric Railway Journal for July 26, 1913, page 140.


Baggage
Smoking
Passengers
Vest.
Vest.
Passengers
Vest.
MOTOR CAR
TRAILER
Trailer Light Bus
Bell Chord
Trailer Light Jumper
Signal Line Bus
Signal Line Jumper
⊗ Signals, with necessary resistance, to be located so as to be audible on both sides of bulkheads.
⊙ Signal line connectors, as per print No. B-11-A.
⊡ Trailer light connectors, as per print No. C-5-A, used for light heater and other auxiliary circuits.
⊠ Signal sws. operated by bell cord, and connecting trailer light with signal line bus.

C. E. R. A. STANDARDS—PROPOSED LOCATION OF ELECTRO-PNEUMATIC SIGNAL WHISTLES AND WIRING

In connection with the standard train signal system the committee proposed a standard arrangement of electromagnetic signals for car interiors. The report did not go into details regarding the location of the accessory apparatus which would necessarily have to be determined by local conditions, but defined the location of the signal whistles so that they could be readily heard by trainmen from any part of the car. This proposed arrangement is shown in the accompanying cut.

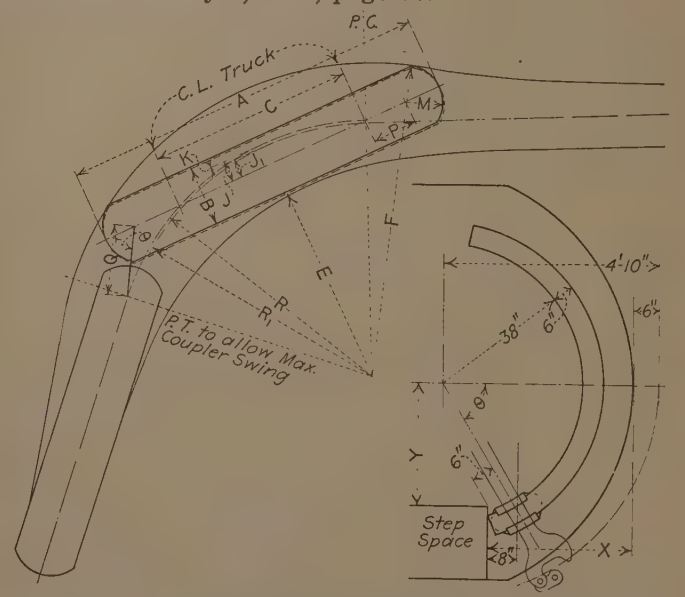
The committee considered that it was advisable to use a connector for the signal line between cars which


IMPREG. MAPLE SHELL
H.R. COPPER CONTACT SPR'G.
PHOS. BRONZE RETAIN. SPR'G.
NO. 14-20 BRASS MACH. STUD
NO. 14-20 BRASS MACH. NUT
Soldered
#6-32 Tap
No. 6 B&S.G. Flex. Cable 60" long.
BRASS CONTACT PLUG
No. 6-32 Round Hd. Brass Mach. Screws

C. E. R. A. STANDARDS—PROPOSED NEW STANDARD TRAILER-LIGHT CONNECTOR

would not intercouple with the trailer-light connector, and in view of the fact that the present standard trailer-light connector had been found to be of insufficient current-carrying capacity, especially when electric heaters were employed, it was recommended that the present standard trailer-light connector, as reproduced in the Electric Railway Journal for July 1, 1911, page 32, should be adopted as a standard signal-line connector. The committee then recommended that a new standard trailer-light connector be adopted in place of the old one. The details of this are shown in one of the accompanying line cuts.

With regard to the standard end connections for interurban cars, the committee recommended the revision of the present arrangement to provide for the additional line as mentioned above. This arrangement was shown in an illustration in the Electric Railway Journal for July 5, 1913, page 30.



C. E. R. A. STANDARDS—DIAGRAM SHOWING CLEARANCES OF CAR BODIES AND ANGULAR SWING OF COUPLERS

In connection with the discussion on the subject "Mounting of Radial Couplers," the committee submitted for inclusion in the proceedings of the association a table prepared by the Ohio Brass Company which showed the clearances of car bodies and the angular swing of couplers when two-car trains were passing around curves of short radius. This table is

published below in condensed form, the most important features in it being given. It applies only to curves with a radius of 35 ft. and to cars that have a bumper beam radius of 5 ft., an overhang between the bolster and the bumper beam of 11 ft., and a projection of the coupler pulling face 6 in. beyond the bumper beam at the center line of the car.

CLEARANCE OF CAR BODY AND ANGULAR SWING OF COUPLER FOR 35 FT. CURVE AND 11 FT. OVERHANG

General Car Dimensions			Radii of Car Clearance Lines for Car Positions Entirely on the Curve		4 Ft. 10 In. M.C.B. Coupler Data 6 In. Projection Over Buffer Center Line		
Length Over Buffers	Width	Truck Centers			Angular Swing of Coupler from Car Center Line	Clearance in Inches from Step to End of Car	Clearance in Inches from Step to Car Center Line
A	B	C	Inside E	Outside F	Θ	X	Y
70 ft.	10 ft.	48 ft.	20.14 ft.	44.36 ft.	86 deg. 42 min.	57.64 in.	36.40 in.
65 ft.	10 ft.	43 ft.	22.31 ft.	43.96 ft.	79 deg. 22 min.	52.43 in.	30.27 in.
60 ft.	10 ft.	38 ft.	24.11 ft.	43.59 ft.	72 deg. 15 min.	47.51 in.	33.70 in.
55 ft.	10 ft.	33 ft.	25.59 ft.	43.19 ft.	65 deg. 22 min.	42.92 in.	34.19 in.
50 ft.	10 ft.	28 ft.	26.81 ft.	42.79 ft.	58 deg. 56 min.	38.85 in.	33.43 in.
45 ft.	10 ft.	23 ft.	27.80 ft.	42.40 ft.	52 deg. 18 min.	34.92 in.	31.92 in.
40 ft.	10 ft.	18 ft.	28.53 ft.	41.99 ft.	45 deg. 48 min.	31.42 in.	39.74 in.

NOTE: A decrease in width of car to 8 ft. increases value of E by 1 ft. but does not affect value of F.

The formulas from which this table was made up are given below, the terms used in these being shown in the accompanying diagram.

R = Radius of center line of track curve

Wb = Distance between wheel centers on truck

K = Distance between center line of track and center of truck, when truck is on the curve.

$$K = R - \sqrt{R^2 - \left(\frac{wb}{2}\right)^2}$$

$K = 0.23$ ft. when $R = 35$ ft. and $wb = 8$ ft.

$R_1 = R - K$

$J = R - \sqrt{R^2 - (C/2)^2}$

$J_1 = R_1 - \sqrt{R_1^2 - (c/2)^2}$

$E = R_1 - J_1 - \frac{B}{2}$

$$F = \sqrt{\left(\frac{A}{2} - M\right)^2 + (R - J)^2} + M$$

Angle of coupler swing, $\Theta = 180$ deg. — (angle L + angle N)

$$L = \text{angle whose tangent} = \sqrt{\frac{R^2 - (c/2)^2}{\frac{c}{2} + P}}$$

$$N = \text{angle whose cosine} = \frac{c \times p + Q^2 + P^2}{2\,Q\,\sqrt{R^2 + (C \times P) + P^2}}$$

$X = 5Z - 41 \cos \Theta + 8 = 60 - 41 \cos \Theta$

$$Y = (52 - X) \tan \Theta + \frac{6}{\cos \Theta}$$

$$= 41 \sin \Theta - 8 \tan \Theta + \frac{6}{\cos \Theta}$$

The results given by these formulas are expressed in feet. The values of E and F give the radius of the clearance lines for the car under consideration when the car is wholly on the curve. The clearance lines draw in toward the track at the ends of the curve, changing from the circular arcs with radii E and F to practically straight, converging lines. No provision has been made in the formulas for super-elevation of the outer rail of the curve. In case this condition exists, allowance at the inside of the curve must be made not only for the tilting of the car but also for the compression of the springs on the side toward which the center of gravity of the car body has been moved, this being equivalent to an increase in width of body.

Municipal Ownership for Capital

For the District of Columbia Committee of the House of Representatives Representative Robert Crosser, of Cleveland, has filed the majority report approving the Crosser bill for the government ownership of the street railways in the District of Columbia. The report is a voluminous one, filled with tabulations of statistics and citations from the testimony taken by the committee, as well as from the books of writers on political economy. The minority report, which is being prepared by Representative S. E. Winslow, of Worcester, Mass., has not been finished and an extension of time is to be granted by the House for its filing. Until that report has been made, no action will be taken on the bill. There is little likelihood that the bill will be called up at the present session of Congress.

Representative Crosser's report asserts that government ownership of the street railways would result in better service and better wages and that it would take the companies out of politics. Much of the report is devoted to an attempt to prove that regulation of street railways is not effective, particularly where efforts have been made to divorce regulation from local influence. The report declares that there should be no competition in street car service, and devotes considerable attention to charges of overcapitalization and false accounting. It is asserted the employees of private companies do not receive as fair treatment as municipalities accord them, not because of any ill-feeling on the part of the private employer, but because of the desire to keep down expenses and increase profits, and that one of the most serious evils resulting from the private ownership and operation of public utilities is the corrupting and weakening of municipal governments.

Mr. Crosser devotes several pages of his report to a criticism of the idea of "regulation." Concerning this he says in part:

"Regulation is now constantly urged by the defenders of private ownership as the proper remedy for the evils which have invariably accompanied private ownership of public utilities, and it is somewhat amusing to know that the private owners of public utilities are the most eager and vociferous in the demands for regulation. The terms of the franchise, the traffic regulation, etc., are all efforts at regulation, but practically every objection and defect that has been shown to apply to private ownership and operation of street railways under these old regulative plans applies to the later methods of regulation. The fact is that the change has been largely a change of name. The regulating body is now generally called a public utility commission, whereas it was formerly called a council or board of aldermen. In this connection, however, it is interesting to note one essential change upon which the public utilities are insisting, and that is the transfer of the regulating authority from local to state officials. The state board is much less responsive to the will of the people of the municipality, who are the only ones directly affected."

As a resident of Cleveland, and a follower of the late Mayor Johnson, Representative Crosser complains particularly about the troubles in his own city. He discusses the controversy in Cleveland and states that he cites the case simply to serve as one example of the very natural tendency of a privately owned public utility to resist in every way possible every effort to regulate it in any way which will seriously interfere with its profits,

and also to show the tendency of commissions who are not solely responsible to the persons directly affected by their decisions. According to Mr. Crosser, the fundamental cause for the failure of commission regulation is the natural and unavoidable antagonism between the interest of the private owner of public utilities on the one hand and the general public on the other. The private owner's natural tendency is to procure the largest amount of revenue possible for the least service necessary. "On the other hand," says Mr. Crosser, "the municipality is not concerned in earning a profit on its street railway system, but is concerned only in operating the system, so as to furnish the best service possible at the lowest price which will enable it to pay expenses. So far as the public official in charge of a municipally owned public utility succeeds in providing the best service at the lowest price, just so far is he a successful man in the eyes of his employer. According to his success will be his reputation, the certainty of employment, and the increase of his compensation toward the maximum for the kind of work in which he is engaged.

"There would be," the report continues, "no corruption and scandal in connection with efforts to procure special privileges or to resist governmental restrictions, because the municipality requires no special privilege and has no other restrictions than those self-imposed. Experience shows that the rates of fare of a municipally owned street railway are materially less than those of the privately owned systems. There are no big dividends to pay but instead usually a very low rate of interest. There is no over-capitalization, and there are no large promoters' and attorneys' fees to be paid for lobbying.

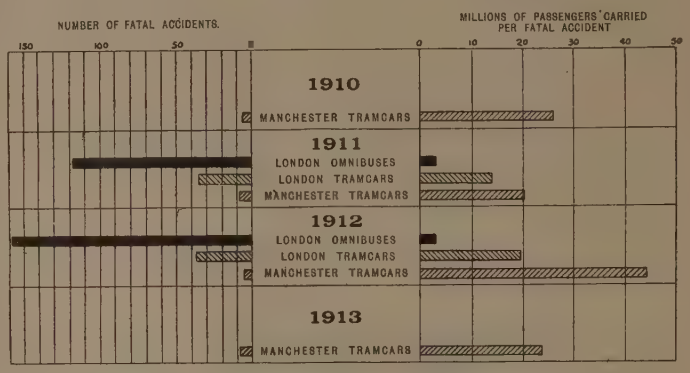
"The chief and really the only argument of any consequence urged against municipal ownership is that machine politicians would control the employees of a municipally operated street railway to perpetuate themselves in power. It must be remembered, however, that the city administration would be held responsible for the conduct of the street railway system. If the service should be inferior as a result of employing incompetent men, the city administration would suffer at the next election. With newspapers free from such influences as private street railways can and do bring to bear upon them they could and would without restraint criticise any attempt by public officials to place political supporters in the street railway service, regardless of competency. The fact is that private ownership fosters the political machine to a far greater degree than public ownership."

Mr. Crosser says that there are two municipally owned street railways in the United States, at Monroe, La., and San Francisco, Cal., and he insists that both have proved successful. The report presents a tabulation of British statistics to show that municipally owned railway lines are more liberal in extensions in non-profitable territory than are privately owned systems and that municipal ownership also results in reduced fares. Figures from the report of the National Civic Federation are used by Mr. Crosser in trying to prove that municipal operation results in a reduction of working hours, increased wages and welfare activities for aged employees. The report concludes with a statement of the financial and physical details of the street railway systems in the District of Columbia.

Forty-five employees of the Pennsylvania Railroad have recently been retired under the pension rules of the company. Two of the men have been in the company's service more than fifty-two years, while twenty have worked for the railroad forty years or longer. One motorman served fifty-three years and three months.

Traffic Study in Manchester, England

J. M. McElroy, general manager Manchester Corporation Tramways, has recently submitted to the city an extensive report on the congestion problem in that city. This report is based on the study of the local situation as well as of the traffic problems in other cities with data obtained by personal visits by the manager during the past year to New York, Boston, Philadelphia, Chicago, Pittsburgh, Newark, Toronto, Montreal, Paris, Berlin, Vienna and Hamburg. The report is accompanied by maps, diagrams and other particulars of the

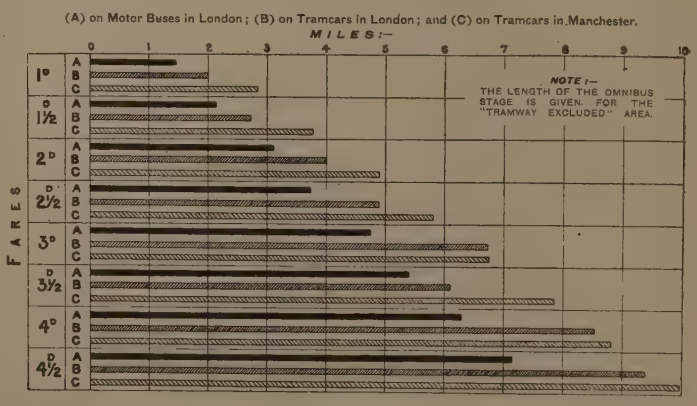


MANCHESTER REPORT—DIAGRAM SHOWING COMPARISON OF FATAL ACCIDENTS TO PASSENGERS CARRIED

cities visited. An interesting discussion is given on the practice in each city. Below will be found an abstract of the London bus situation and some of the conclusions reached.

THE LONDON SITUATION

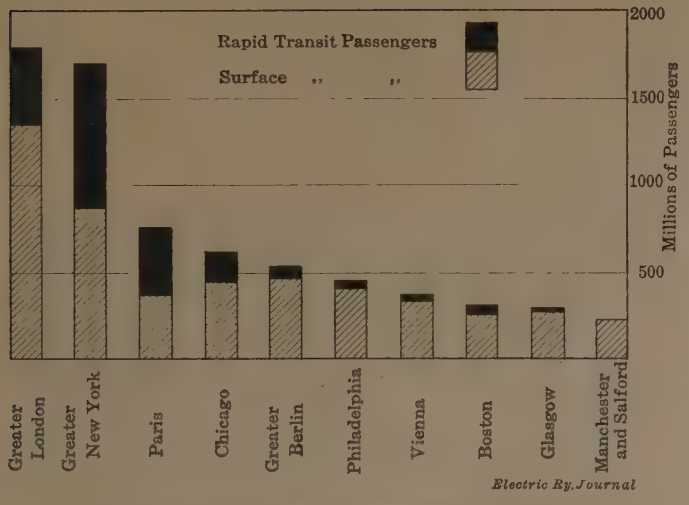
A defect of the London rapid transit system, according to Mr. McElroy, is that it has not been laid out in accordance with a comprehensive plan to meet the requirements of the city as a whole. There have been several recommendations in favor of a permanent authority for controlling all the means of transit in London, but this has never been carried into effect. Recently there has been an amalgamation of tube companies and bus companies so that, with the exception



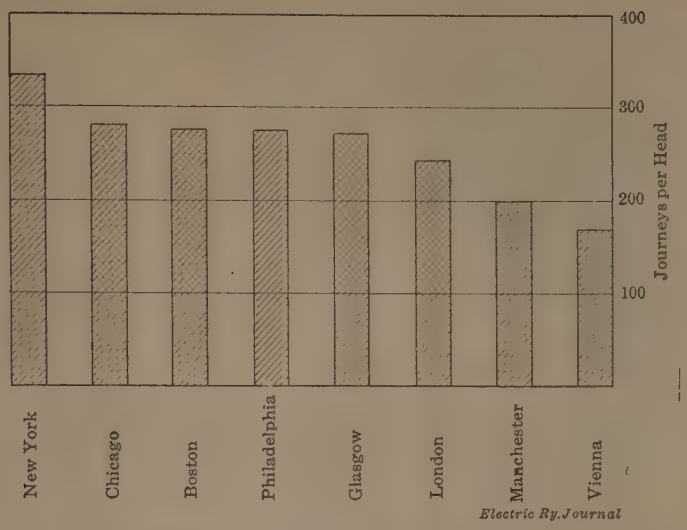
MANCHESTER REPORT—DIAGRAM SHOWING COMPARATIVE DISTANCES WHICH CAN BE TRAVELLED FOR DIFFERENT RATES OF FARES

of the tramways operated by the London County Council, the passenger transportation business in London is almost entirely in the hands of one traffic combine. This combination has brought many advantages to the traveling public, but Mr. McElroy suggests that there is danger that the public interests may not be properly safeguarded if there is no control or regulation by some permanent traffic authority.

There is no city in any part of the world so favorably circumstanced for the working of motor buses as London. It has the best paved streets in the world, and



MANCHESTER REPORT—PASSENGERS CARRIED IN DIFFERENT CITIES



MANCHESTER REPORT—RIDES PER HEAD OF POPULATION

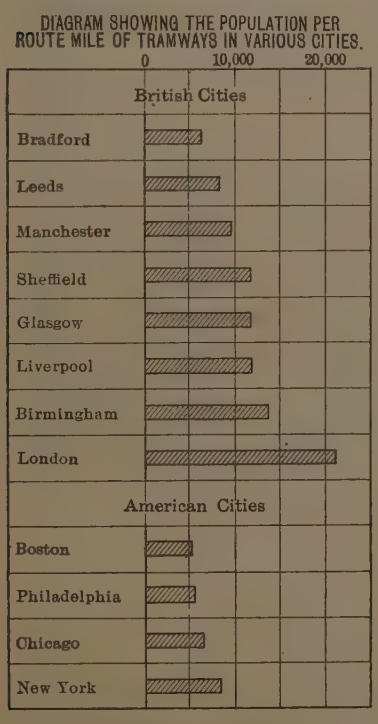
the riding habits of the people are increasing rapidly. Moreover, the construction of tramways has not been permitted in the heart of London, therefore the motor buses supply what the tramways cannot, namely, through service. In this part of the city the bus fares are higher, due to lack of competition, and in many cases are about 1 penny per mile.

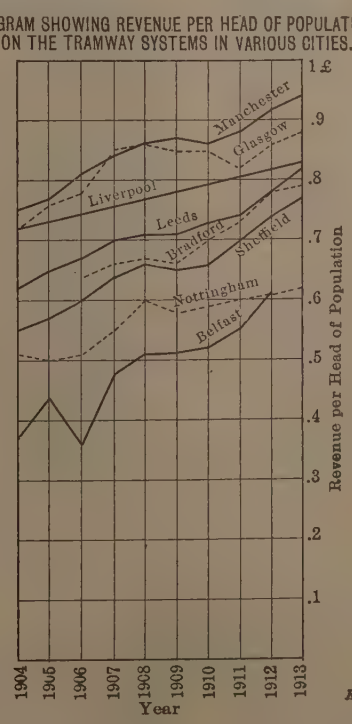
The running time of the motor buses compare favorably with rapid transit in the tubes. It has been found, however, that the buses are more dangerous on streets than the tram cars. The number of passengers carried per fatal accident by the motor buses of the London General Omnibus Company in 1911 was 2,900,000, and in 1912 the number was 3,100,000, whereas for the tram cars of the London City Tramways the figures were 14,400,000 and 19,800,000. This condition is due largely to the fact that as yet no satisfactory lifeguard has been devised for use on the buses.

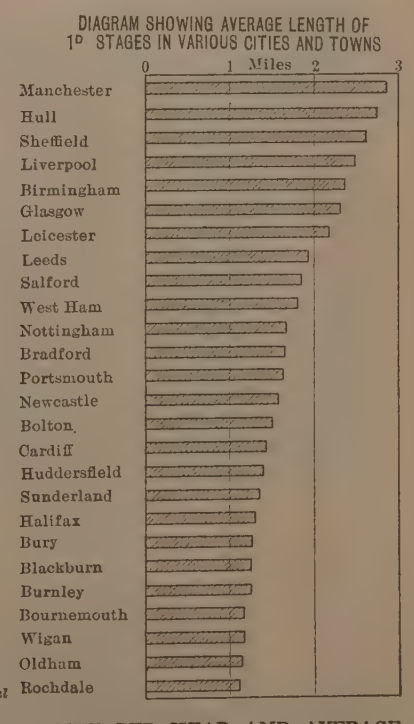
CONCLUSIONS

The conclusions in general are that a comprehensive plan for transportation should be made in the case of every large city and should be followed, that where there are rapid transit lines they should be under the same management as the surface lines so as to supplement the service of the surface lines, but that generally the subways should not be used by the surface cars. The reason for this statement is that on account of their great expense of construction, the underground lines must be worked by high-speed trains operating under very close headway. In discussing rolling stock improvements the report says that the points to seek in car design are to improve rapid loading and unloading, to prevent boarding and alighting accidents, to decrease the number of stopping places and to simplify fare collection. Mr. McElroy speaks favorably of the operation of the pay-as-you-enter system in America and thinks that while the obstacles in the way of applying it to a zone system are serious they are not insurmountable.

The bridge department of New York City is arranging to divert to the Manhattan Bridge many of the surface railway cars now operated over the Brooklyn Bridge on account of the necessity for reconstructing the Brooklyn Bridge to fit it to care for the operation of rapid transit lines under the dual subway contracts.







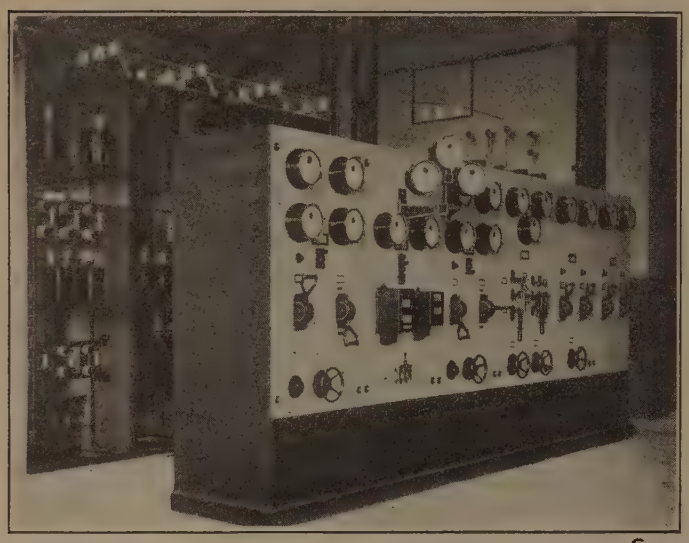
MANCHESTER REPORT—DIAGRAMS SHOWING POPULATION PER MILE OF ROUTE, REVENUE PER HEAD AND AVERAGE LENGTH OF 1-PENNY STAGES IN DIFFERENT CITIES

Some "Safety First" Practices in German Substations

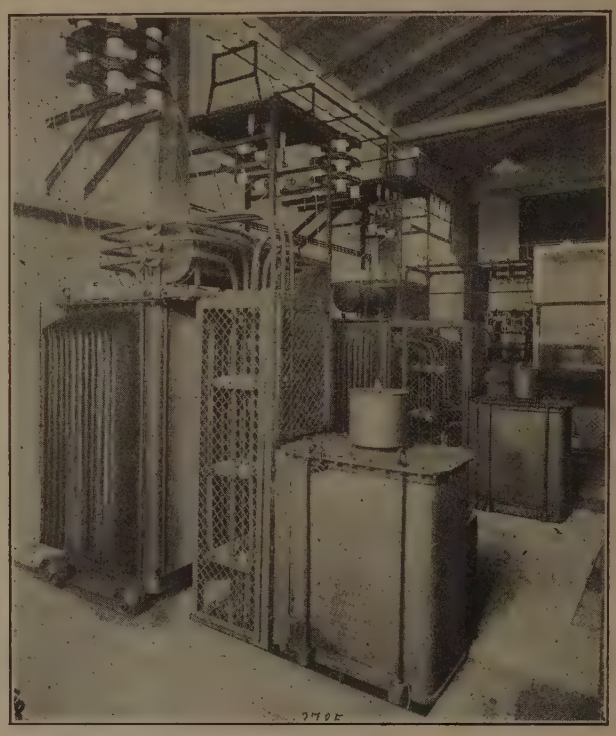
The "safety first" movement in the United States is comparatively new, but in Germany and other European countries many schemes for the protection of electrical and other workers have been used for years. The different industries have co-operative accident insurance organizations, and committees from these bodies decide upon and enforce the protective measures to be used.

The accompanying illustrations of some substations equipped by the Siemens-Schuckert Company are typical of the care given to this subject. Thus at the Heilwig Street substation of the Hamburg Rapid Transit System all of the switching equipment for each machine unit is mounted on a carriage in a properly-labeled cabinet. When any repairs or adjustments are required the carriage is drawn out along a set of rails to a place where the work can be performed in perfect safety and under the best space and lighting conditions. In the view showing transformers and reactance coils, heavy screening is employed to prevent contact with the reactances. In a second view it will be observed that the high-tension switching sections behind the switchboard are screened to a height of about 6 ft. These screens are divided into doors which may be opened for the inspection of individual sections. Where separate control apparatus is installed for single operating units, like motor-generator sets, it is common to inclose such equipment in a wire cage to which access is obtainable only by authorized employees. A third view shows that protection against transformer leads is obtainable by the addition of a tray-like side-screened structure at the top. In addition to these forms of protection, enameled warning signs lettered in red on a white surface and also marked with the symbol for a lightning stroke are installed wherever necessary.

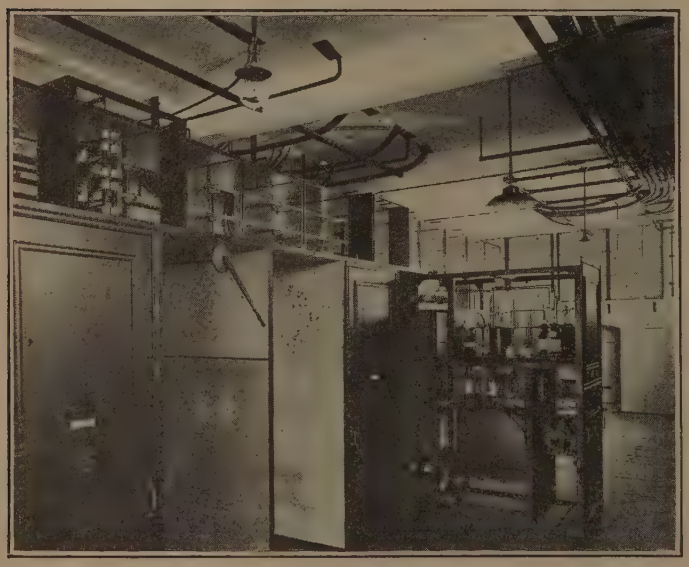
It is also common practice in the power plants, substations and machine shops of Germany to inclose all belting to a reasonable height, and to paint the dangerous parts of machinery a vivid red.



SUBSTATION AT TROMPET, SHOWING PROTECTION OF HIGH-TENSION GEAR BEHIND SWITCHBOARD



SUBSTATION AT CRONENBERG, SHOWING THE TRANSFORMERS WITH PROTECTED REACTANCE COILS



SUBSTATION, HEILWIG STREET, HAMBURG, SHOWING HIGH-TENSION ROOM WITH MOVABLE SWITCHING SECTIONS

SUBSTATION AT FLÖRCHINGEN, GERMANY, SHOWING TERMINAL PROTECTION OF TRANSFORMERS

COMMUNICATIONS

Correspondence Courses for Accountants

PUBLIC SERVICE RAILWAY COMPANY
NEWARK, N. J., June 23, 1914.

To the Editors:

The course in accounting prepared by the committee on education of the American Electric Railway Accountants' Association and described in the issue of the ELECTRIC RAILWAY JOURNAL for May 30, page 1214, is the latest effort in correspondence courses by a national association.

The fee of $10 for each year's lectures in the new course is an exceedingly low one.

The usefulness of these correspondence courses, conducted by trained teachers and under the technical advice of those best qualified to give it, has been amply demonstrated. The work is done without any idea of profit and the charge to the student is a nominal one. The information given cannot be obtained elsewhere except at a very much greater cost. The course can only be a success with the co-operation of accounting officers of member companies. The enrollment of employees in such a course is bound to have a stimulating effect upon them and add to their efficiency. The effect upon the student will be to give him something more than an enforced interest in his daily work and should make him a much more valuable employee.

It may be of interest to accounting officers who have had no experience with educational courses of this character to know that courses along similar lines have been given by the National Commercial Gas Association for the past three years. The first course consisted of ten lectures on salesmanship, each with a series of ten questions. A lesson was issued each month. Seven hundred and twenty-five students enrolled and a large percentage completed the course. A similar course on business organization was given the second year. Six hundred and sixty-eight students enrolled and a large percentage completed this course also. The third course is now being given. It consists of ten lectures on the utilization of gas appliances. This course is a most complete one, and 3850 students have enrolled. Each lecture gives the history of a class of appliances, the details of their manufacture, their efficiencies, their application, installation and operation.

The success of these three courses has led the Gas Association to plan for a three-year course. This course is now in preparation and will comprise the following subjects:

First year, business English; penmanship; arithmetic; mensuration; elementary algebra; elementary geometry; elementary physics (mechanics, heat, electricity, light); elementary chemistry.

Second year, manufacture and distribution of gas; generation and distribution of electricity; utilization of gas and electricity (lighting appliances, heating and cooking appliances, power and industrial appliances).

Third year, corporation organization and control; finance, accounting and office management; salesmanship and sales development; inter-department relations; public relations.

The fee for the three-year course will be $60, if payments are spread over the three-year period, or $50 if the fee is paid in advance. It will be necessary to have 1000 men enroll in order to conduct it.

The plan under which the third-year course on utilization of gas appliances has been conducted has provided for a class leader wherever there have been sufficient men in a company taking the course to warrant it. The class leader, through correspondence with the director of the course, prepares himself in advance of the date on which the answers have to be sent in and calls the members of the class together to discuss the lessons and the questions. It has been found that these meetings and the discussions have increased the usefulness of the course tremendously and have caused the men to retain interest in the work. The class leaders are also of very great assistance to the director, and the American Electric Railway Accountants' Association will do well to adopt a similar practice as soon as the enrollments justify them in going ahead with their educational program.

Accounting knowledge is useful to every employee of an electric railway and no doubt the Committee on Education of the American Electric Railway Accountants' Association will find a large proportion of men outside of those in the accounting department enrolled in the course in the same manner as the educational committee of the National Commercial Gas Association found that many men outside of the departments interested were taking the course provided by them.

Both self-interest and the desire to become efficient should bring about a large enrollment in this very practical course on accounting prepared by the committee on education of the American Electric Railway Accountants' Association. P. S. YOUNG, Treasurer.

The Springfield Report on Electrolysis

NEW YORK, June 30, 1914.

To the Editors:

The Springfield electrolysis tests, which were reported in abstract in the ELECTRIC RAILWAY JOURNAL for March 21, page 646, were evidently in mind when you wrote the editorial printed in the issue of June 27, page 1428. I wish to call attention to the fact that the conditions in Springfield were very favorable on account of the co-operation of all of the public utility companies involved. Owing to the expiration of certain franchises the city was able to use pressure in bringing about such co-operation, which could not have been obtained before. This co-operation was absolutely necessary to secure the interlacing of the negative return systems of the local utilities. It would have been impracticable for either company having a power plant inside the city limits to develop a reasonably safe system alone.

The method adopted in Springfield for preventing electrolytic troubles was the negative return system of the type called "the insulated negative feeder system." In this the feeders radiating from the power station to the rails are distributed in accordance with the current congestion and the potential gradients. The accepted practice is to use the same insulating methods as are employed on the positive side of the distribution system. In a few isolated cases scrap rails, bonded together and buried, have been used for the return feeders from rails to negative busbars, but on account of the corrosion of the bonds between the rails this practice has not proved reliable. While insulated return feeders were found practicable and presumably economical in Springfield, it does not follow that this system should be used everywhere, for the Springfield case must be considered a special one.

In order that the best return system may be provided for any particular case, the engineers involved should be familiar with all methods of protection and should investigate them with regard to the peculiarities of the special system under study. I have not found two systems which present identical conditions in regard to the electrolytic relation of sub-surface conductors and the negative return. In more than one

hundred systems personally examined since 1896, no one method of relief has proved to be a panacea. In all cases it is not only the prevention of electrolysis which must be considered but also the cost of the recommended plan which must not be overlooked.

Returning to the subject of the insulated return system it should be noted that there are conditions under which the extension of the negative return will not accomplish desirable results. In the first place, when the auxiliary negative feeders are carried far from the power plant, the area of contact between rail and soil is increased and the resistance of contact is decreased. The same current can then be dissipated from pipe surfaces with less difference of potential between pipe and soil. When there is no accidental metallic connection between the rail return and the underground conductor system the return current divides between the rail return and the earth pipe return in inverse proportion to their resistances. Anything which tends to reduce the resistance of the earth path, therefore, deflects more current from the rail return and increases the electrolytic corrosion in the area where the pipe is positive to the soil. It is important to note that the vital difference of potential involved in this matter is that which exists between the pipes and the adjacent electrolyte. The difference of potential between pipe and rail is the sum of the pipe surface drop, the counter emf and the contact resistance drop between rail and earth. In addition there is a further resistance drop due to paving conditions. Now if the resistance between rail and soil is lowered, the difference of potential between the electrolyte and sub-surface conductors is increased, with consequent greater danger of corrosion. Another condition which is produced by the expansion of the negative feeder system is the increase in the difference of potential between rails and adjacent roadbeds in negative territory. This increases the corrosion at the foot of the rail, such corrosion being known as "foot-wear." If this foot-wear is more rapid than the head-wear on the rail the normal useful length of life of the rail is not obtained. Where rails have concrete footings or bases, chemical reactions are set up decrystallizing the bond between the rails and the concrete, producing the condition known as "rotting of the concrete." This is due to the acid condition produced in the concrete at its junction with the rail when current leaks from the rail surface.

In a number of respects the Springfield report seems to me to be incomplete, and possibly misleading. The report does not contain data regarding the increased difference of potential between pipe and surrounding electrolyte due to the increase in leakage areas, as outlined above. Further, the tests were made in winter, during which season the frost in the ground increases the total resistance of the earth circuit. At the same time the resistance of the rail return is much less than in summer on account of the comparatively high temperature co-efficient of steel. The over-all voltages given in the report are not the maximum voltages, as higher voltages are often found than those existing between the end of the road and the power station. This is especially true where there are metallic connections between rails and pipe. In Springfield these metallic connections seem not to have been tested for, although they were found to exist during a previous survey. The report does not state whether or not the resistances of the pressure wires were compensated for in determining the over-all voltages. As these were telephone wires measuring, say, 8 ohms per thousand feet their resistances would exert considerable influence on the results if not corrected. The cost of the losses in the Springfield case are incorrectly estimated, for central stations of the size of those in Springfield would produce additional energy to make up the losses at ½ cent per kw-hr. This overstatement of the cost of energy leads to incorrect conclusions. Operating engineers know that all the cost which can be charged in this case is that of additional coal. The increased efficiency in the outlying feeders is apparent but not real. The reduction of potential gradient caused by these feeders is due to the local increases of potential between the rail and the negative bus at the power station. The increased local losses should be deducted from the apparent economy affected by the outlying negative feeders. I cannot see, by any argument of logic or mathematics, how the aggregate drop between rail and negative bus can be increased and yet at the same time the losses in the negative transmission system be decreased. Furthermore, I do not believe negative boosters to be an economical proposition as compared with proper feeders, from the standpoint of operation, depreciation and attendance. Boosters have been installed in several cases in this country but they have been abandoned. The system installed in Springfield may be perfect, but the data in the report do not warrant us in judging it to be so.

Let us consider briefly the objections which are alleged against the pipe drainage system. In these objections the usual statement of the proportion of current returning over the drainage feeders indicates metallic connections between rails and pipe. In any case where 10 per cent or more of the total station current returns over the pipe feeders there is undoubtedly metallic connection between the rails and underground conduction structures which have been temporarily connected to the negative bus. The amount of this current flow in the pipe system, not metallically connected to the rails, can always be brought down to from 5 to 7 per cent of the station output by properly adjusting the pipe drainage feeders with due regard to the potential gradient in the rail and the congestion of current around the power station.

It is often argued from theoretical considerations that insulating joints in pipe lines, whether they be ordinary joints insulated by caulking or special joints of the insulated type, will cause corrosion on the positive side of the joint. As a practical matter I have never found a case of corrosion on the positive side of a pipe adjacent to an insulating joint. This matter is continually raised in electrolysis suits, and railway companies have continually asked for samples of corroded pipe adjacent to insulated joints. Such exhibits have never been made for the reason that the theoretical corrosion is that due to the assumed electrical conditions surrounding the joint, but, as a fact, the current flow there is actually negligible in amount. In a test made on an 8-in. cast-iron main buried in earth saturated with moisture, measurements made 4 ft. on either side of an insulating joint showed a resistance of 30 ohms when a 5-volt pressure was first applied. This rose to 180 ohms in sixty hours. The effect of introducing an insulating joint in the line of pipe paralleling an electric railway line is to force the current into a path in shunt with the joint. This is not true in a pipe-drainage system composed of a quadrilateral system of conductors covering an area over which the lines of rail radiate. In this case the current has presented to it many paths of metallic return, and main arteries of circulation of current are often found in pipes not adjacent to the railway line.

I would not advocate a pipe-drainage system as the only means for pipe protection, but the objections raised against its adoption in the Springfield report are more academic and theoretical than practical. No conscien-

tious engineer would attempt to utilize the pipe-drainage system without first connecting the pipes and cable sheaths to the negative busbars, and then testing the system to determine the exact conditions of the piping as a conductor. He would then relieve those sections where the potential gradient is too high or differs too much from that of paralleling rails or where shunting from one system to another occurs. In a pipe-drainage system of negative underground conductors, all pipes and cable sheaths must be treated as one negative system of return, and so connected that the potential relations of sub-surface conductors in any one locality will be practically the same. The pipe-drainage plan must not be applied to any system which has metallic connections between pipes and the rails at any point, and it is, furthermore, illegal to apply such a system where such metallic connections exist under the general law that one cannot use another's property for his own purposes. Metallic contacts must first be located by well-known means. They are often found in iron bridges, gate boxes, surface connections and forgotten connections which existed originally between rail and pipe. These must all be removed and the resistance of the earth interposed between the pipe system and the rail.

In regard to the expense of the pipe-drainage system, it should be noted that the return current to be dealt with is from 5 to 7 per cent of the total current output of the station only. Hence the cost of conductor through the territory over which pipe and cable sheaths are drained is greatly less than that of any insulated negative return system which increases the negative return drop and has to handle the total output of the station. Furthermore, by the proper location of the drainage feeders a compounding effect can be produced by the natural shifting of the load over the system by which portions of the pipe are made negative for a short period, and an advantageous hydrating effect be produced which tends to neutralize the positive ionic condition existing between pipe surface and electrolyte.

In conclusion, I wish to call attention to the fact that engineering for betterment is the useful spending of a dollar to earn its value by producing greater economy. Academic methods which do not comprehend this phase of engineering are costly and experimental. The electric railways in Ohio have been restricted in their earning powers by legislation under threats regarding franchises. Pressure is now brought to bear on them to safeguard the property of other utility companies which claim damage from electrolysis. The railway companies are further burdened by methods which have for their purpose the development of a system to conform to those arbitrary rules known as the British Board of Trade provisions. These provisions may or may not prove effective, serious electrolytic damage having arisen when property has been maintained under them. What ought to be accomplished is the protection of the pipe surfaces against accentuated corrosion due to current flow from them; to keep these surfaces at potentials below those at which ionization is set up in the electrolyte which surrounds them. The eliminating voltage in any natural ground-water electrolyte is readily determined and the reduction of the potential difference between pipe and electrolyte is a matter of feeder resistance.

On the above two fundamental principles rest the solution of the problem of providing effective preventive measures. Without the application of these principles in every given locality under treatment the results that are attained are only visionary.

ALBERT B. HERRICK, Consulting Engineer.

Accounting Terms

MOBILE, ALA., June 23, 1914.

To the Editors:

Your editorial of June 20, 1914, "What is Treasury Stock?" is very timely.

It has been realized for a long time by electric railway accountants and others interested that terms are used in accounting, whose meaning is not clear, and in some cases names are used interchangeably, while their meaning is different.

A celebrated authority on accounting makes this statement:—"Unfortunately, despite the advancement made in accounting, there is a most embarrassing confusion in terminology, so that one can never be sure of just what is meant by a given account."

Realizing this trouble, the executive committee of the American Electric Railway Accountants' Association appointed a committee on accounting definitions, and it is hoped that through a report of this committee a number of conflicting terms may be clearly defined, and the adoption by the association of the defintions will do much towards clearing up confusion of terms now existing.

A recent newspaper article discussing a reorganization plan stated that provision may also be made for an issue of "adjustment income bonds." This term is capable of several interpretations, the correct meaning not being clear without additional explanation.

This is a subject of vital importance to the owners of bonds and stocks, as well as to operating officials of corporations, and it is hoped that the Accountants' Association will be able to do its part in defining terms in accounting which are not clearly understood by all who use them.

M. W. GLOVER.

Princeton Meeting of the Society for the Promotion of Engineering Education

The twenty-second annual meeting of the Society for the Promotion of Engineering Education was held at Princeton, N. J., from June 23 to 26. The proceedings cover a wide range of subjects but the central idea brought out was that emphasis should be laid upon fundamental principles, and that education is not so much a matter of administration as of purpose and spirit. The meeting was notable from the attendance of official representatives of a large number of educational institutions.

The following elections were made at the last session: President, Anson Marston, dean of the division of engineering, Iowa State College, Ames, Iowa; vice-presidents, Henry H. Norris, ELECTRIC RAILWAY JOURNAL, New York, and C. Russ Richards, acting dean of the College of Engineering, University of Illinois, Urbana, Ill.; secretary, F. L. Bishop, dean of the School of Engineering, University of Pittsburgh, Pittsburgh, Pa.; treasurer, William O. Wiley, secretary John Wiley & Sons, New York; members of the council, R. H. Fernald, professor of dynamical engineering, University of Pennsylvania, Philadelphia, Pa.; A. H. Fuller, dean of the College of Engineering, University of Washington, Seattle, Wash.; A. M. Greene, Jr., professor of mechanical engineering, Renssalær Polytechnic Institute, Troy, N. Y.; E. V. Huntington, assistant professor of mathematics, Harvard University, Cambridge, Mass.; Vladimir Karapetoff, professor of electrical engineering, Cornell University, Ithaca, N. Y.; D. C. Miller, professor of physics, Case School of Applied Science, Cleveland, Ohio, and W. M. Riggs, president of the Clemson Agriculture and Mechanical College of South Carolina, Clemson College, S. C.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

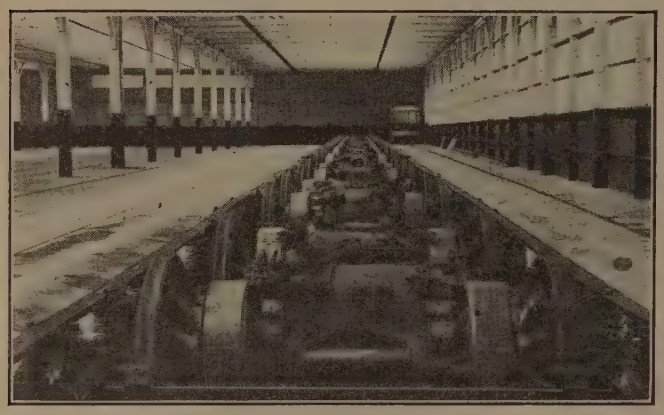
(Contributions from the Men in the Field are Solicited and Will be Paid for at Special Rates.)

Double-Pinion Drives for Railway Motors

BY A. A. BLACKBURN, CHIEF ENGINEER, BELFAST (IRELAND) CITY TRAMWAYS

In the *Tramway & Railway World* for April 7, 1910, I contributed an article regarding the use of double-geared drives on the Belfast City Tramways. Since that time we have equipped approximately 150 car trucks with this drive, and they have proved to be uniformly successful.

Our experience with this double drive during the past four years has enabled us to make a fair comparison between the single and the double geared method of driving, and the results obtained have been so satisfactory that we are now equipping all of our 300 trucks with the double drive as rapidly as possible. We have had no reason to alter our views in regard to the claims set forth in the above mentioned article, but as a matter of fact we are finding even greater improvements in the wearing parts on all the trucks fitted with this drive, as against those of the single gear.



IRISH GEARS—TRUCKS EQUIPPED WITH DOUBLE GEARS AND PINIONS READY FOR INSTALLATION UNDER CARS

Cars have been sent in to the works, on an average, about every nine months for wheel flange wear, but we find that the cars fitted with the double gears stay in service for an average period of eleven months before being sent into the works. We attribute this to the fact that the four gears drive the truck parallel on the track. These cars also climb hills better, as the wheels have not the same tendency to slip. The trucks do not have the same corner-thrust action, consequently they keep more square and the wheels wear more evenly.

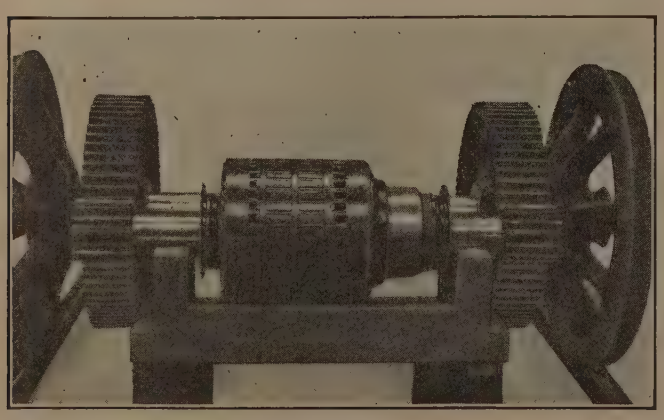
Motormen report that the double-geared cars run much steadier and start easier. In starting the car there is not the same jerk as with single geared trucks, therefore there is not the same wear on gears and pinions. These cars have run on every service and over every route on the system, and careful meter tests show that the current consumption per car mile is slightly less. Armatures and motor-suspension bearings wear more evenly and last longer. Commutators do not flash across and they wear better.

In fitting the double gear-wheels to an axle, a certain amount of care is necessary to see that the gear-wheel teeth are parallel and are perfectly in line, one with the other. To obtain these results everything depends upon the accuracy with which the gear-wheel keyseats are cut as the least alteration in the keyseat or key throws the gears out of mesh. The armature shaft is lengthened out at the commutator end to suit the extra pinion, and the same care must be observed here as with the gears, that is to say, the keyways in the pinions must be cut exactly parallel one with the other.

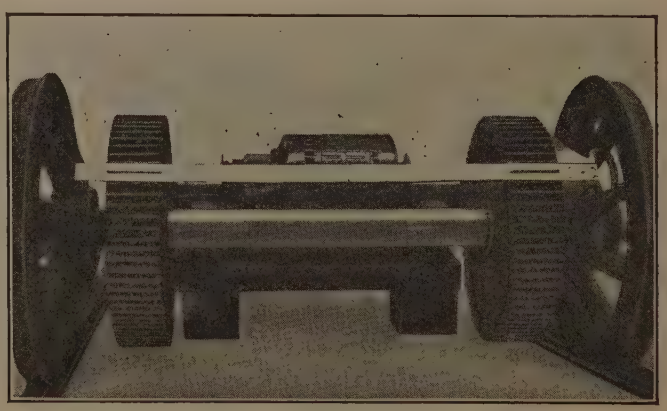
We use the British Westinghouse Company's 68-tooth gears and 14-tooth pinions. They are supplied to us with keyseats accurately machined out for this purpose, but slight errors will sometimes arise. Therefore all our gear wheels are tested before fitting, by placing two gear wheels together on an axle fitted with a long key. By this means we are able to see if the gear-wheel teeth and keyseats correspond.

Pinions are tested by a similar means. A short piece of axle is turned with a taper at each end, and fitted with two keys. Two pinions are then pushed together until they meet. We are then able to see at a glance whether the teeth are in line.

Occasionally a gear key will have to be side-stepped to permit moving the gear wheel around until the gear teeth are in line, and when this has to be done we proceed as follows: First of all one gear is fitted firmly



IRISH GEARS—ARMATURE WITH ITS DOUBLE PINIONS IN MESH WITH GEARS



IRISH GEARS—T-SQUARE USED TO ALIGN TEETH OF DOUBLE GEARS

into position, then the second gear is placed over its keyseat, from which the key has been removed, and then the gear is carefully adjusted by means of a steel T-square, into the blade of which are cut slots which fit over one tooth in each of the two gears. The amount of side-step or off-set required by the key can be seen at once from the relative position of the keyways in the shaft and in the gear.

Overhead Problems—Poles and Adjuncts

BY CHARLES RUFUS HARTE, CONSTRUCTION ENGINEER CONNECTICUT COMPANY

The fact that much overhead construction might well be common for trolley, telephone, telegraph and lighting has led to a movement for a joint committee representative of all interests to deal with such questions, and although apparently no definite steps as yet have been taken to that end, it is undoubtedly a move of the near future.

As regards wooden poles, however, no action is needed; although differing somewhat in wording the important requirements of all concerned are identical. The following table shows standard dimensions of the principal woods used.

MINIMUM POLE DIMENSIONS

Natural Poles

Length of Pole, Feet	CHESTNUT: Circumferences in Inches at Top and "Ground" Class A	Class B	Crook, Inches	WHITE CEDAR: Eastern Circumferences in Inches at Top and "Ground" Class A	Class B	Crook, Ins.	Western Circumferences in Inches at Top and "Ground" Class A	Class B	Crook, Inches	JUNIPER: Circumferences in Inches at Top and "Ground" Class A	Class B
30	24 40	22 36	..	24 40	22 36	..	28 37	25 34	5	24 40	22 37
35	24 43	22 40	10	24 43	22 38	10½	28 40	25 36	6	24 43	22 40
40	24 45	22 43	11	24 47	22 43	12	28 43	25 38	7	24 47	22 44
45	24 48	22 47	11	24 50	22 47	9	28 45	25 40	8	24 50	22 48
50	24 51	22 50	11	24 53	22 50	10	28 47	25 42	8	24 53	22 52
55	22 54	22 53	12	24 56	22 53	11	28 49	25 44	9	24 56	.. ..
60	22 57	22 56	13	24 59	22 56	12	28 52	25 46	10	24 59	.. ..
65	22 60	22 59	14	.. ..	.. ..	..	28 54	25 48	11	.. ..	.. ..
70	22 63	22 62	15								
75	22 66	22 65	..	"Ground" circumference shall be taken 6 ft. from butt.							
80	22 70	22 69	..	Crook is maximum distance from pole to string stretched							
85	22 73	22 72	..	from point 6 ft. from butt to point at top.							
90	22 76	22 75	..								

Special Poles

Length of Pole, Feet	SAWED REDWOOD: Dimensions in Inches at Class A Top	Class A Ground	Class B Top	Class B Ground	CREOSOTED YELLOW PINE: Circumference in Inches at Class A Top	Class A Ground	Class B Top	Class B Ground
30	7x7	11 x11	6x6	10x10	22	35	20	32
35	7x7	12 x12	6x6	11x11	22	38	20	34
40	7x7	13 x13	6x6	12x12	22	40	20	36
45	7x7	14 x14	6x6	13x13	22	42½	20	38
50	7x7	15½x15½	6x6	14x14	22	44½	20	40
55	.....	.....	.....	.....	22	47	20	42½
60	.....	.....	.....	.....	22	49	20	44½
65	.....	.....	.....	.....	22	51	20	47
70	.....	.....	.....	.....	22	53	20	49
75	.....	.....	.....	.....	22	55	20	51
80	.....	.....	.....	.....	22	57	20	53

"Ground" circumference to be taken 6 ft. from butt.

In tubular steel poles there is no such uniformity; the makers list a large series of "standard" types and a still larger series of "specials." The table in the 1913 report of the power distribution committee of the American Electric Railway Engineering Association gives ninety-six combinations between the lengths of 28 ft. and 35 ft. There is little reason, however, for any such conditions. As listed the poles have lengths varying by single feet, and pull resistances varying by but a few pounds. Lengths varying by 2½ ft. and three values of pull resistance in each size would be more than ample to meet all conditions economically, and would require just twelve combinations as against the present ninety-six.

For transmission work and the like there have been developed some excellent structural forms of pole, but for ordinary trolley work their use has not proved economical. The concrete pole is still in the developmental stage. There are many installations of excellent appearance and behavior, but the fact that they are not being reproduced in most cases raises some question as to their real economy. The suggested A. E. R. E. A. design promises much and it is to be hoped it will receive a thorough test in the near future; there is a large field for a reasonably low cost concrete pole that can be handled by the average pole gang and be depended upon.

SETTING POLES

Pole setting follows the practice of the earlier users, the depths under normal conditions being as follows:

Length of Pole:	DEPTH OF HOLE: In Rock or Concrete	In Earth
30 ft.	5 ft. 0 in.	6 ft. 0 in.
35 ft.	5 ft. 6 in.	6 ft. 0 in.
40 ft.	5 ft. 6 in.	6 ft. 6 in.
45 ft.	6 ft. 0 in.	6 ft. 6 in.
50 ft.	6 ft. 6 in.	7 ft. 0 in.
55 ft.	6 ft. 6 in.	7 ft. 6 in.
60 ft.	7 ft. 0 in.	8 ft. 0 in.
65 ft.	7 ft. 0 in.	8 ft. 6 in.
70 ft.	7 ft. 0 in.	9 ft. 0 in.

On side slopes the measurements should be made from the low side, and in soft or treacherous ground greater depths may be necessary. Ordinarily the roadbed furnishes good setting, but occasionally it is necessary to bolt carrier frames to the pole at the ground line. In dry sand or running wet soil the excavation is often best made inside a barrel or casing which is driven down as the hole deepens, and in which the pole is eventually set. Such casing, and for that matter all holes, should be large enough to permit thorough tamping without the necessity of cutting the butt.

The butt always should be cut square, and in poor soil those poles should be used which have the greatest butt area. Some years ago a line foreman on work under the writer's charge made the brilliant discovery that by pointing the butts he could stand poles on end in a swamp section and work them down to position without digging any holes at all. His remarkable record in pole setting across the meadow was not understood until later, when the crossarms had stopped further settlement and the poles were extracted. In this particular instance squaring the butts and filling in the new holes with a bed of gravel about 2 ft. deep was sufficient to prevent further trouble.

Barrel holes, holes in soil not requiring barrelling but of poor holding capacity, or where the pole is subject to heavy stresses, and holes for steel poles, are often filled with 1:3:5 concrete. If practicable, this concrete should extend 6 in. above the ground with a diameter 8 in. greater than that of the pole at that point, and should then pitch up to the pole at an angle of 45 deg., this to prevent the otherwise probable decay or corrosion just above the concrete. In city work, however, it is rarely possible to bring the concrete above the surface.

Most wood poles are still hand set, being laid on the ground with the butt at the hole and then up-ended, first by hand, a jenny or pole prop "following up," then as soon as the end is high enough, the pole pike-poled till upright. A plank is usually set up in the hole for the butt to thrust against, to prevent caving in the side. A skilful crew will keep the pole steadily moving from the start, making the shifts from hands to pikes and through the several lengths of pikes without a hitch. The advantage of mechanical help is fast being recognized, however, and there is now on the market, besides many home-made ones, at least one patented derrick. These derricks expedite greatly the direct handling of the poles, obviating the aggravating delays which often result from caving in the side of the hole during erection and simplifying the manipulation of the

pole where it has to go up through a network of existing wires.

Particularly where there are bending strains it is well to wedge the pole with large pieces of rock, and if these strains are heavy key blocks should also be used. One block should be applied at the bottom of the hole opposite the pull and the other at the surface on the same side as the pull. "Four by eight" scantling serves well for this purpose, the bottom key being made 2 ft. long and the surface key 4 ft. long.

RAKING AND ANCHORAGE

Poles should be given a rake away from the track of 6 in. in 24 ft. for bracket poles and 12 in. in 24 ft. for span poles if of wood, and half of these values if of steel. This rake chiefly is for appearance; a pole originally set plumb and having very little deflection looks as if it was tumbling on to the tracks, while with a rake at the bottom, even though the top be deflected in much more than the rake, the pole has an appearance of vigorous resistance and strength that is reassuring to "Pro Bono Publico," "Safety" and other well-known guardians of the general public.

SETTING POLES BY HAND WITH TEN MEN

In city work anchors are usually out of the question, and stability must be secured either through heavy poles with special foundations or by high guys attached to one or more poles at sufficient height above the ground to ensure clearance. In the open, a most substantial anchorage can be had in the direction of the line, if clearance is not essential, by guying to the bases of the adjacent poles. It is preferable, however, to make the attachment at least 7 ft. above the ground, and usually this can safely be done. Where pole attachments are not practicable some form of anchor must be used. The old standby "deadman" consists of a galvanized rod 6 ft. long and 1 in. diameter, with 4-in. x 4-in. x ¼-in. square plate washer and nut at one end, and eye at other. Run through a half-tie buried 4 ft. under ground, the rod having the same inclination as the anchor guy it is to hold (this should be 45 deg. if practicable); this makes about the best all-around anchor to be had. In good soil the patent anchors which require little or no digging are excellent, but in rocky soils the interferences usually more than offset the advantages.

In rock that can stand the action a wedge bolt is good; for softer rock an eyebolt 2 ft. long should be leaded, sulphured or cemented in a hole as deep as the bolt shank length. Whichever kind of rock anchor is used, it should be set at right angles to the pull of the guy, which latter should make an angle of 45 deg. with the horizontal if practicable. Up to an angle of 75 deg. the customary two-turn wrap will usually hold on the pole without slipping. Where local conditions force a more nearly vertical guy, however, guy hooks should be used on either side, although a guy requiring hooks, as a matter of fact, is of very little service.

Where there is any likelihood that persons will pass at points where guys are low, the latter should be made conspicuous by a marker about 3 in. diameter, painted white. Plank 1-in. thick is sometimes used, but it tends to get edgeways to the traffic, and the line of contact with the guy is a fruitful source of corrosion. The best device is a piece of pipe or tube slipped over the guy and resting on the head of the anchor rod or on a clamp, keeping it about 1 ft. from the ground. Where it is undesirable to undo an existing guy two pieces of half-round molding can well be used, in which case the faces in contact and the groove in which the strand lies should be white leaded. In this, as in all other work, care should be taken that adjacent guards are of the same length and in line. Nothing looks more slovenly than a line of guys, spans, or any other construction which should be parallel but are not, and in which the various fittings are out of line.

INSULATION

Recognition of the danger of unexpected slight shocks which may cause a lineman to fall from sheer surprise is developing a general tendency to double insulate all steel pole work from the trolley, the hanger forming the first break, and on span work a strain insulator 5 ft. from the pole making the second. With brackets the limited space introduces complications not yet worked out with entire satisfaction. About the best treatment so far is by the use of a strain insulator in the overhead support rod and a fiber bushing in the pole seat casting. The use of insulators in the strand requires an extra long bracket arm, as there should be at least 8 in. of free strand between the hanger and the insulator, or between the insulator and the end casting if the former is attached directly to the hanger.

SETTING POLES WITH TRACK DERRICK—FIVE MEN AND TWO ONLOOKERS

Where globe or similar composition strains are used

the arm length can be reduced, but the growing use of the wood strain makes the latter the important factor. Recently there have been loud cries for interlocked strain insulators, but it is to the writer's mind an open question to what extent this is warranted. The use of poor stock and poorer treatment by irresponsible makers gave the early wood strains a bad reputation, but as at present supplied by the better class of manufacturers they are entirely reliable. Composition strains hold if the composition squeezes out, but many of their failures are in the malleable castings themselves, dropping the lines, while a slight injury to the composition destroys the insulation. "Goose eggs" of porcelain and tough glass, not to mention the Hewlett and "saddle" types of disk insulators, give an absolute interlock, but many engineers consider it unwise to use such materials where they will be subject to sudden shock.

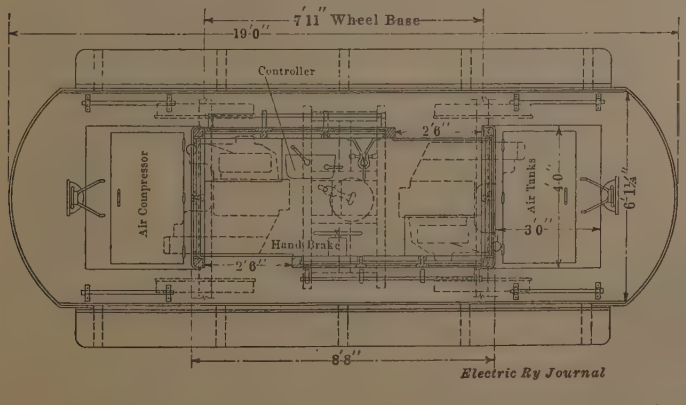
Cleveland Railway's Switching Locomotive

BY TERRANCE SCULLIN, MASTER MECHANIC THE CLEVELAND RAILWAY COMPANY

The operation of trail cars in trains during the rush hours in Cleveland, Ohio, has grown to a point where the Cleveland Railway has found it necessary to provide special switching locomotives at three principal carhouses. These are used to make up trains in the yard as well as to relieve the motors of the trail cars at the close of the rush hours. In general these locomotives

THE CLEVELAND RAILWAY'S SWITCHING LOCOMOTIVE

are built with a cab, 4 ft. x 8 ft. 8 in. in plan, mounted on an old-style single truck with a 7-ft. 11-in. wheelbase and equipped with two Westinghouse 49 motors. The cab is arranged for double-end operation, being provided with a controller set in the middle of one side to permit the motorman to face either end without difficulty. The air compressor and reservoirs are housed under sheet



PLAN SHOWING EQUIPMENT ON CLEVELAND LOCOMOTIVE

metal hoods at each end of the cab on the car floor which is 19 ft. long x 6 ft. wide. The floor is of wooden construction mounted on five sections of 5-in. 80-lb. rail, which serve both as longitudinal sills and ballast. Completely equipped this locomotive weighs approximately 20,500 lb., and the two 35-hp motors are so geared that the locomotive will handle two standard Cleveland trailers up a 4 per cent grade, or push seven standard trailers on a level track.

The floor plan and arrangement of the control equipment are shown in one of the accompanying illustrations along with a side view of the locomotive. It will also be noted that the locomotive is equipped with side running boards and a continuous arrangement of grab handles which completely surround the cab so that a switchman may board from any position. Instead of standard drawbars these locomotives are equipped with the Cleveland Railway's standard couplers, described in connection with its new center-entrance motor cars in the issue of ELECTRIC RAILWAY JOURNAL for Feb. 28, on page 458. As this coupler is approximately 6 ft. in length it allows for considerable variation in coupler heights and permits the locomotive to push or pull the trailers around the sharpest yard curves.

Metal Tokens for Tickets at Lexington, Ky.

Late in March of the current year the Kentucky Traction & Terminal Company, Lexington, Ky., began the sale of six metal disks for 25 cents in place of paper tickets. The disks are wrapped at the office of the company in envelopes bearing the name of the company and the fac-simile signature of F. W. Bacon, vice-president. The object of selling the disks in this way is twofold: First, to take the sale of tickets out of the hands of the conductors, and, second, to prevent the disks from being rewrapped by the conductors or the public.

OBVERSE AND REVERSE OF METAL TOKENS

The form of accounting on the cars is as follows: Fares are collected according to the prepayment system with the aid of Johnson fare boxes with locked drawers, which are removed at night by the carhouse clerk. The total traffic is registered on the inside register. Change is made by the conductors in wrapped envelopes, which are furnished to the conductors in the same way as the disks. Thus the conductors are not allowed to make change for anything under 50 cents or to sell the disks loose. The disks when dropped in the fare box make the same registration as a 5-cent piece and are thus accounted for on the fare-box dial as full fare. An allocation of straight 5-cent fares and disk fares is made by the auditing department. The tokens, as reproduced, consist of a disk of the exact size and thickness of a nickel, the disk being perforated, however, to form the letter "K" (Kentucky). The head of the disk is marked "Good for 5-Cent Ride—City Car." The tail is marked "Kentucky Traction & Terminal Company" along the periphery, and "1914" on the middle of the "K." The envelopes are of a special red paper. To date, this method of fare collection has proved very satisfactory both to the public and to the company.

At a recent election in Bristol, England, the question of municipal ownership of tramways was submitted to the voters. There were 18,057 votes in favor of municipal ownership and 14,894 against.

Switchgear Ordered for the London & North-Western Railway's Electrification

The British Westinghouse Electric & Manufacturing Company, Ltd., has secured the contract for the high-tension and low-tension switchgear and details for eleven substations, in connection with the London & North-Western Railway's North London electrification. The switchboard panels on order at the present time total 258, comprising 129 high-tension panels and cubicles, 107 d.c. substation panels and twenty-two low-tension a.c. and d.c. boards in the main station. The substations are situated at Camden, Queen's Park, Stonebridge Park, Kenton, Pinney, Bushey, Dalston, Broad Street, Willesden, West End Lane and Acton. There are three rotary converters in each substation, excepting at Broad Street and Acton, in which there are two; of these rotaries six, situated in Camden and Bushey substations, are of 1000-kw capacity, and the rest of the rotaries have each a capacity of 750 kw. The number of high-tension feeders coming into the substations total thirty, and there are also eighteen high-tension outgoing feeders.

The oil-break circuit-breakers are of remote mechanically operated type, except at Stonebridge Park substation where the switches will be of the solenoid electrically operated type. The switches are so arranged that phase separation can be carried out throughout the whole of the switchboard structure, each separate phase of the switch being contained in a separate tank, and in a molded stone cubicle entirely separated from the other phases.

The busbars are sectionalized in each substation, and each machine can be connected through isolating switches to either of two main busbar sections. Isolating switches are being provided on each side of the main oil switches. All incoming feeders will be fitted with reverse-current relays for tripping the oil circuit-breakers, and all outgoing feeders and transformer circuits will have overload relays with time-limit attachments. The rotary converter high-tension circuits will also have overload time-limit relays.

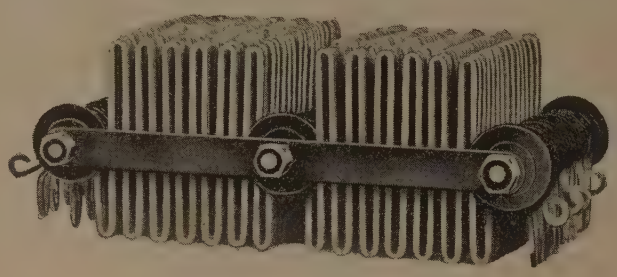
Each section of busbar will be fitted with horn-type static dischargers combined with the usual resistances and isolating switches. The panels on which are mounted the instruments and handles for operating the oil circuit-breaker are situated on the floor level, and behind them are the cubicles containing the oil switches. These are linked to the operating handles, which are mounted on the switchboard by means of levers and rods. In the case of the Stonebridge Park substation, the operating panels will also be on the floor level and the switches will be electrically operated.

The cellwork consists of molded stone. The slate panels of which the high-tension control board and also the low-tension switchboards are made will have a black marine finish. The low-tension panels, exclusive of battery and booster panels, which form the subject of another contract, deal with 100 outgoing feeders and thirty-one rotary converters on the d.c. side. The rotary converter circuits have reverse-current, single-pole circuit-breakers, fitted with a tripping arrangement for operation by speed limiting devices on the rotaries. The track-feeder panels which control both poles of one feeder have single-pole overload circuit-breakers for 2000 amp and two single-pole knife switches for the same current. Sector pattern moving coil ammeters with illuminated dials are used. The circuit-breakers are of type "C" traction pattern.

In addition to the above panels there are lighting and auxiliary panels in all the substations, and in the power station a low-tension a.c. and low-tension d.c. board are also to be supplied under this contract to deal with the circuits feeding the auxiliary machinery, lighting, etc. The contract is estimated to be worth between $250,000 and $300,000.

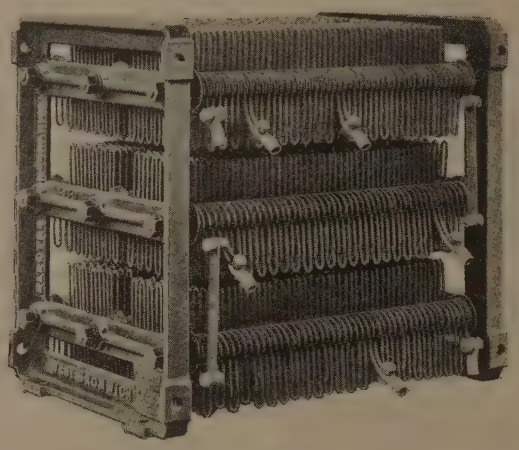
Unbreakable and Jointless Grid Resistors

A new jointless and unbreakable grid resistor, known as the "E M B," is meeting with favor on the electric railways of England and other countries. These resistors are supplied by the Electro-Mechanical Brake Company, Ltd., West Bromwich, England, which has



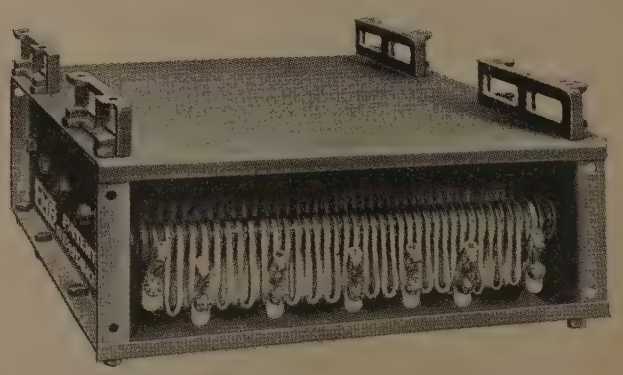
SECTION OF SINGLE GRID

already made about 3000 installations. One object of the new grids is to eliminate fragility. A second object is to avoid the troubles due to failure to maintain good contact at the ends of the grids because of corrosion and loss of pressure on the contact surfaces. The latter



RESISTANCE FOR ATTACHING INSIDE WOOD LOCKER ON CAR PLATFORM

trouble is frequent with the ordinary grid owing to vibration and to the inevitable expansion and contraction in service. As a large number of the grids are made from one length of material, the circuit does not depend on a contact joint from grid to grid and conse-



UNDER PLATFORM TYPE RESISTANCE

quently there is no risk from open circuits or intermittent contacts. The manufacturers point out that although grids of an unbreakable type can be produced

by stamping, individual grids necessarily must have end contacts so that in this respect stampings have the same defect as castings. Apart from the advantage of no end contacts the new grid is much more rigid than stampings. The temperature coefficient of this rustless material is similar to that of cast iron. It is said to retain its shape even at bright red heat, to have excellent radiating properties and to be free from scale. Its uniform cross section avoids local fusing, and for a given current capacity it occupies practically the same space as cast grids. These resistors can be supplied in any number of units per equipment in a wide range of sizes, either for under-car or platform accommodation, as may be preferred. They are also made for use with other electrical apparatus, notably with crane motors where perfect circuits are so important.

European Chain Insulators

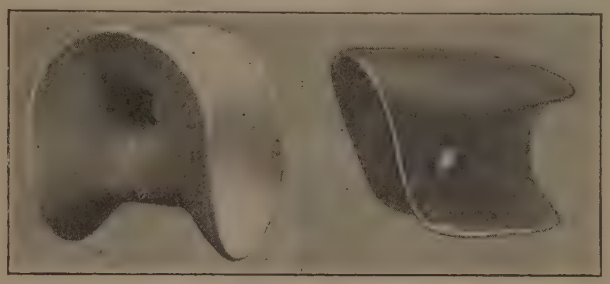
The chain insulators of Vedovelli, Priestley & Company, Paris, France, have found such wide use abroad in both low and high-tension railway work that American engineers may be interested in a brief description of their properties and uses. These insulators are made up in six sizes, *A*, *B*, *C*, *D*, *E* and *F*. Their chief characteristics are shown in the accompanying table:

	Approximate Breakdown Voltage Dry—Volts	Breaking Strain—Pounds
A	15,000	2,204
B	22,000	3,306
C	30,000	4,408
D	40,000	6,612
E	55,000	11,020
F	70,000	15,428

The insulators are made in porcelain or glass, and can be glazed in various colors such as green, brown and white. Type *C* is that most commonly used in high-tension railway work.

The great advantage of this type of insulator is that the thickness throughout is the same at all points of the elements, and thus no internal stresses are produced during baking. The insulators are linked together by galvanized steel wires forming a chain, and the porcelain is always in compression. A chain can be made up for any pressures and loads, and it is necessary only to increase the number of links in series to insure that the chain will withstand a higher pressure. These chains can be placed in parallel for very great mechanical loads, although the largest size will withstand about 15,400 lb., which is sufficient for loads as met with in practice.

A number of views are presented of the insulator alone and of several of its applications to railway work. The first view shows the company's ordinary design at



ORDINARY LINK INSULATOR AND HOODED LINK INSULATOR FOR HORIZONTAL INSTALLATION

the left and the new hooded type at the right. The latter is superior to the older design in so far as the metal ligaments are protected from rain when the insulator is placed in a horizontal position, thus maintaining a high insulating value even in stormy weather.

SECTION INSULATOR WITH LINK INSULATOR

For insulators installed vertically, a metal hood is provided to keep off the rain. The adaptability of this insulator to railway work is clearly indicated by the diverse applications shown. The simplest, perhaps, is that for span construction on the 10,000-volt, single-

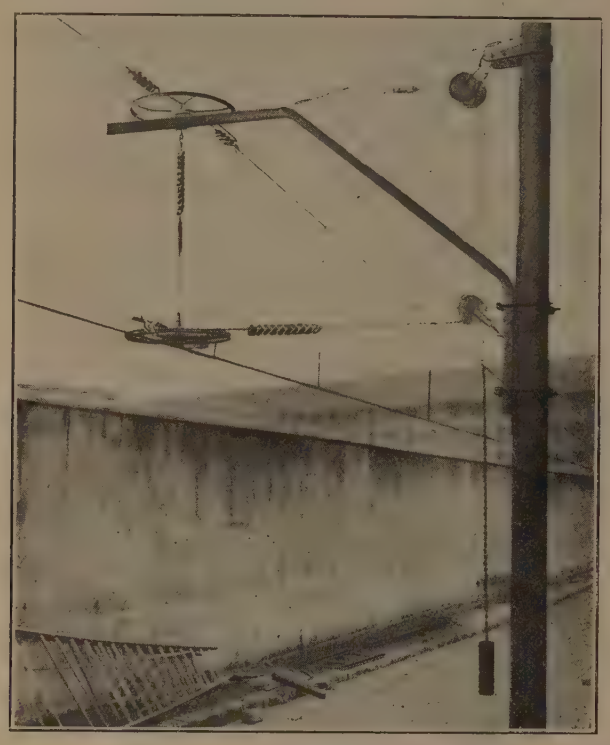
SEMI-RIGID TYPE 12,500-VOLT SINGLE-PHASE SUSPENSION ON THE MIDI RAILWAY IN SOUTHERN FRANCE

10,000-VOLT SINGLE-PHASE CATENARY SPAN CONSTRUCTION OVER A PUBLIC HIGHWAY

SECTIONALIZING POLE WITH LIGHTNING ARRESTERS AND OUTDOOR TYPE OIL SWITCH

phase Oriental Pyrenees Railway. In this instance, where a plain catenary is suspended over the public highway from wooden poles, ample insulation is offered by placing six insulators in series in each of the span wires and at the junction of these wires at one side.

On the 12,500-volt, single-phase line of the Midi Railway, the semi-rigid type of suspension, devised by M. Paul, chief engineer of this railway, is used. In this system the contact wire is part of a rigid girder suspended from cables which are anchored to the inwardly curved arms of successive steel poles of ladder design. A bracket to keep the contact girder in line extends outward from a point near the top "rung" of each pole. The insulation between the catenary cable and the contact wire system, and at the anchorages of the catenary is effected by means of link insulators. Drawings of this construction were presented in the Electric Railway Journal for July 6, 1912, page 26. Another Midi view shows the use of link insulators at an automatic tension installation on a bracket section. It will be observed that insulation was provided not only in the catenary and hanger wires themselves but also in the chain to which the tension take-up weight is hung. Still another example is afforded by the illustration of a sectionalizing pole with outdoor oil switch and horn lightning arresters on the 6600-volt single-phase line of the Libourne Tramways at Saint-André-de-Cubzac. Link insulators are inserted in the catenary and also in the section insulator as presented in the separate view.



AUTOMATIC TENSION DEVICE WITH SUSPENDED WEIGHT ON MIDI RAILWAY

At a recent meeting of the Jovian League, of Lexington, heard the report of the delegates from that city who attended the Philadelphia convention. The delegates were most enthusiastic as to the future developments of electrical enterprises and advocated progress in Lexington. J. B. Fitzgerald, who was secretary of the local league, has resigned his position with the Lexington Utilities Company and goes with the Westinghouse Electric & Manufacturing Company. He has been succeeded temporarily as secretary by W. N. Hanna.

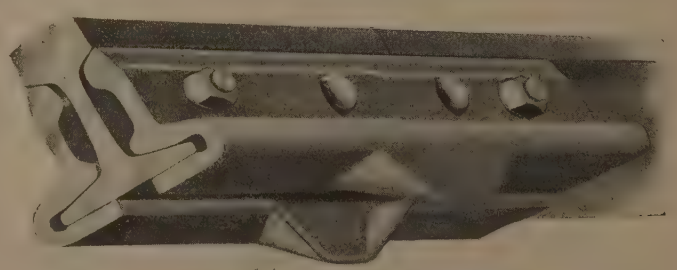
Easily-Adjustable Ground Wire Clamps

The accompanying illustration shows the improved Keystone ground wire clamp of the Electric Service Supplies Company, Philadelphia, Pa. It consists of two identical malleable iron castings, which when fitted together form a clamping jaw to receive either a ¼-in. or 5/16-in. strand. A ⅝-in. bolt of any practicable length is placed through these castings, thus allowing this clamp to be rigidly secured to either bayonet or other ground wire supports used in high-tension transmission line construction. These clamps may also be secured directly to wooden or iron poles by means of a through bolt when angle-iron supports are not used. A noteworthy feature which renders this clamp easy to install is that it requires but one bolt and it is so designed that it may first be secured to the bayonet or pole while the ground wire to be supported is placed therein afterwards. Greater wear is insured for that part of the ground wire inside the clamp on account of the corrugated surface and the flares at either end of the hole. Greater protection is given the strand owing to the small width of 2¼ in., therefore allowing a flare of ¾ in. at each end. The Type B clamps differ from the earlier standard type of this company in that the clamping surface is not corrugated but smooth, with flaring ends. All parts are heavily galvanized to withstand rust.

ADJUSTABLE GROUND WIRE CLAMP

Joint Combining Base-Supported and Suspended Features

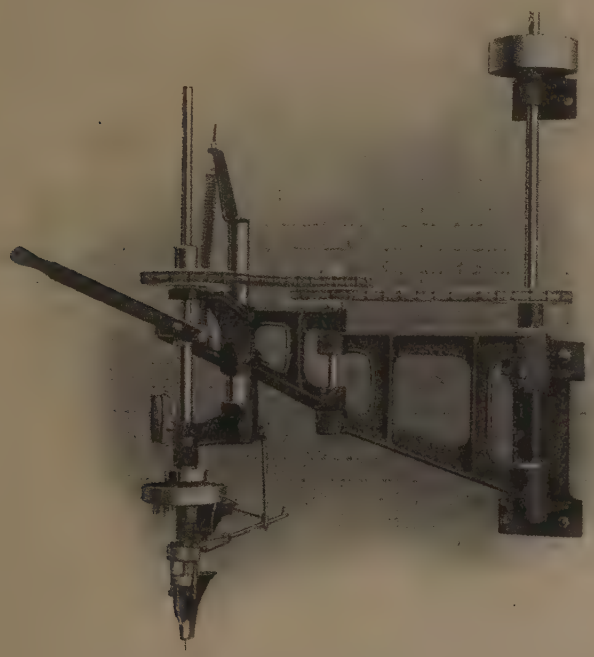
A novel rail splice has been developed by the Track Specialties Company, New York, by combining the salient features of the base supported and suspended joint. Since the weakest part of the track is where the two rails meet, the wave motion can be transmitted properly only with splice bars that have at least the same cross-sectional area as the rails connected. It is asserted that before the "Superior" joint illustrated was invented, no one had constructed a joint with a truss member at the center and provided for base supports immediately before it, without changing the sectional areas. With this joint, tie plates are not required, and the girder depth at the center of the joint is greater than the rail height. The structure at the junction of the two rails is theoretically stronger than the unbroken rail. The method of manufacture consists merely of rolling a bar as shown on the center portion of the splice. Then by means of a bulldozer the two ends are pressed up so that they support the rail base and rest on the ties. Spiking this joint is not recommended, although it is notched to suit if so desired.



JOINT WITH BASE-SUPPORTED AND SUSPENDED FEATURES

Automatic Screw-Driving Machine

The accompanying illustration shows an automatic screw-driving machine, designed for operation within a 3-ft. radial area, which has been put on the market by the Stresau Engineering Company, Brooklyn, N. Y. This machine may be bolted to a wheel or post and is so constructed that the operation can easily and accurately bring the spindle into position on work which cannot be



RADIAL MACHINE WITH AUTOMATIC SCREW-DRIVING ATTACHMENT

manipulated under an ordinary fixed drilling machine. The working stroke of the main spindle is 6 in., and the head of the machine has 9-in. vertical adjustment. The automatic screwdriver is attached to the machine spindle by means of its standard Morse taper shank. It may be detached in a moment and replaced by a different sized screwdriver or some other tool.

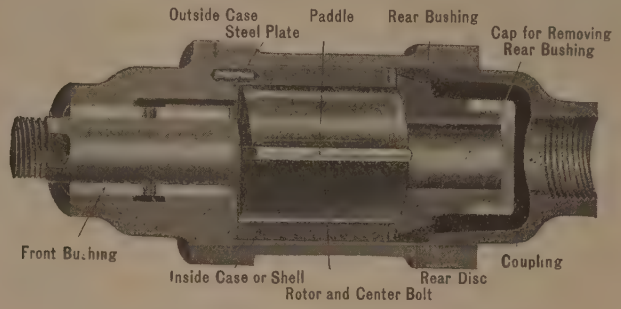
Turbine Cleaner With Vibrating Knocker for Fire-Tube Boilers

A new type of air or steam turbine-driven vibrator knocker head for dislodging scale from the outer surfaces of tubes in return tubular boilers has been recently put on the market by the Lagonda Manufacturing Company, and is shown in the accompanying illus-

VIBRATOR HEAD ATTACHED TO AIR OR STEAM DRIVEN TURBINE

trations. This cleaner also removes the soot from the inner surfaces of the tubes. The soot is loosened by the vibrating knocker and is blown out of the tube ahead of the cleaner by the steam or air exhausting from the front of the turbine.

The knocker head is made of three parts; a cylindrical body somewhat smaller in diameter than the boiler tube, and an eccentrically pivoted lever carrying a clover-shaped knocker on a stud at its free end. The lever fits flush into a triangular recess in the forward face of the main body, the free end swinging in an arc through the center of the head. The three hammer faces of the knocker are shaped to fit the inner circumference of the boiler tube, thus giving a large area of contact with the tube. This arrangement permits the hammer to be made heavy and a firm blow to be struck without injury to the tubes. The extra weight and force of blow facilitates the loosening of stubborn scale. The head is driven at high rotative speeds, the eccentrically pivoted lever carrying the knocker is thrown from side to side and the knocker caused to revolve on its axis at each contact with the tube, giving



SECTIONAL VIEW OF TURBINE CLEANER

a resultant gyratory motion to the knocker and causing it to hit all points of the interior circumference of the tube.

The cleaner is fed into the tube by a flexible rubber hose which furnishes the air or steam pressure. The revolving motion of the head eliminates the necessity of turning the cleaner by twisting the hose. The motor for driving the head is intended for either steam or compressed air and is of the rotary engine type. The air or steam strikes upon radial paddles, thus giving a high rotative speed to the shaft. The paddles themselves are continually held out by the air or steam which is admitted to a chamber behind the paddles so that they always form a tight fit with the case. The motor has four paddles, two of which are always under pressure, so that it is impossible for the motor to stall. An oiling device for these motors mixes the oil with the air or steam supply, thoroughly blowing it into all the bearings and rubbing parts.

Railless Traction in Brighton, England

In his annual report W. Marsh, engineer and general manager of the Brighton Corporation Tramways, Brighton, England, refers to the recent demonstrations with railless cars, which were manufactured by the R. E. T. Construction Company, Limited, London, England. Mr. Marsh said in part: "These trials showed, without question, that, notwithstanding the fact that railless traction cars are dependent upon overhead wires for their power supply, this does not detract from their mobility in traffic, and augurs well for their future success in Brighton. The trials in question were very valuable in showing certain points where improvement could be effected. The Board of Trade was subsequently asked to sanction these, and did so, the result being that you will be able to make a start with vehicles which are an improvement on any in operation in this country at the present time."

The Società Brioschi, of Milan, has made public its plan for the construction of an electric railway from Borgo San Donnino to Salsomaggiore. It forms the first section of a main line from Borgo San Donnino to Borgo Taro, for which plans are now being matured.

LONDON LETTER

(From Our Regular Correspondent)

The nineteenth annual convention of the Incorporated Municipal Electrical Association was held recently at Birmingham. After the usual official welcome by the Lord Mayor, the address of R. A. Chattock, president of the association and chief electrical engineer of the Corporation of Birmingham, was presented. This was followed by a paper, "The Commercial Development of Electricity Supply in Moderate-Sized Towns," by W. A. Vignoles, chief electrical engineer of the Corporation of Grimsby. In the afternoon a visit was paid to the works of the General Electric Company, Ltd., at Witton, where there was a demonstration of electrical vehicles organized by the electrical vehicle committee of the association. The annual dinner of the association was held in the evening. The second day of the convention was held at Coventry. In the morning a paper, "The Design and Operation of Modern Boiler-House Plant," was read by S. E. Fedden, chief electrical engineer of the Corporation of Sheffield. In the afternoon visits were paid to various electricity works and electrical manufacturing plants in the vicinity. The third day of the convention was held at Stratford-on-Avon. Here a paper, "The Standardization of Tariffs," was read by J. Horace Bowden, chief electrical engineer of the Corporation of Poplar. In the afternoon, vehicles conveyed the visitors to Warwick Castle and grounds, returning via Kenilworth. The last day of the convention was devoted to the council meeting and the annual general meeting. On the afternoon of the last day a visit was paid to the Corporation electric generating station, and in the evening a Cinderella dance was given by invitation of the Birmingham entertainments committee.

The project of linking up the new colliery districts at Woodlands and Warmsworth with the Doncaster tramway service is to be proceeded with at once. The rails to the Woodlands will be laid on the grass margins at the side of the road.

The first-class tramcars in Birmingham have been abandoned. In response to a public request specially furnished cars were provided on the Hagley Road route, and the inside fares were doubled, while outside the fares were as usual. Only a small percentage of the passengers have paid the first-class fares.

The electrification of the section of the North-Eastern Railway, between Shildon and Newport, is nearing completion. The line, 18 miles long, is an important one, as it connects the Durham coal fields with the coast and with the great iron manufacturing district. Part of the line has been completed just outside Darlington, and upon this stretch the first of the ten electric locomotives, which are being built at Darlington, is undergoing preliminary tests. The overhead direct-current system is in use on the line. Power is to be generated at 20,000 volts and will be transformed in substations to 3000 volts direct-current for use on the trolley wire.

So as to prevent any misapprehension as to the cause of the discontinuance of the railless trolley service at Dundee, the general manager of the Dundee Corporation Tramways has recently reported that the system has been in operation for one year and eight months and so far as working is concerned has been an unqualified success. The real cause of the trouble has been the roadway. The service, therefore, has been discontinued until the road is put in a reasonably suitable condition.

The Leeds Corporation is seeking by means of a bill to extend the system of railless trolley cars into Wharfedale. Recently a select committee of the House of Lords sanctioned the extension, but laid down general conditions under which the vehicles should be run. The promoters have now introduced new clauses to carry out the decision, and the bill has been ordered to proceed. Those clauses provide that the Corporation shall pay 0.375 of a penny per car mile to the West Riding County Council, as the road authority, for the first three years after the service is started, and that at the end of that period the Corporation shall pay a sum equal to the extra expense incurred in repairing the roads as a result of the railway traffic.

The citizens of Bristol have decided to purchase the tramways from the Bristol Tramways & Carriage Company. The Bristol Corporation has a bill before the House of Lords which has been delayed awaiting the result of the recent poll in favor of the purchase. After passing the House of Lords the bill will have to go to the House of Commons, where further opposition is expected on technical points.

The results of the financial year of the Glasgow Corporation tramways department, which has just closed, constitute another record in respect of the mileage run by the cars, the number of passengers carried, and the revenue from fares. In round figures the number of miles run by the cars since June 1 of last year was 24,400,000; the number of passengers carried was 337,000,000, and the revenue £1,078,000. About 25,500,000 more passengers were carried during the year than in the preceding year, and the increase in revenue amounts to more than £70,000.

With the commencement of the new financial year of the Glasgow tramways, the Corporation has taken over third party risks incurred by the department. Following upon this step, James Dalrymple, general manager of the tramways, has issued a memorandum addressed to motormen and conductors. The aim of the department at present is stated to be a "safety campaign" of the same kind as have been introduced in the cities of the United States. Mr. Dalrymple indicates that he is prepared to recommend that a proportion of any saving in the cost of meeting claims which may accrue through the efforts of motormen and conductors be distributed among them.

The statement has lately been made that most of the street accidents in London happen on tramway routes. The London County Council is issuing a repudiation of the assertion. That the tramway is the safest vehicle, it states, is proved by statistics which indicate that more mishaps occur where there are no trams at all. In 117 miles of streets which are both tramway and motor-bus routes the fatalities caused by power-driven vehicles were, in 1910, 67; in 1911, 107, and in 1912, 126. The tram and bus shares of the accidents were in 1910, nineteen by trams and twenty-six by motor-buses; in 1911, eighteen by trams and forty-six by motor-buses; in 1912, twenty-one by trams and sixty-seven by motor-buses. In 119 miles of routes without trams the fatalities from motor-buses were in the same three years, twenty-three, thirty-nine and seventy. The two divisions of the Metropolitan police which have the largest average number of fatalities per square mile for 1910, 1911 and 1912 are St. James's, with 11.40, and Marylebone, with 8.98. Neither of these has tram lines. The Council, too, quotes the views of other than London experts on the question. Thus, the chief constable of Manchester says that where there is great traffic there must necessarily be a greater risk of accidents, but that the risk is not caused by the tramcars, adding that the motor-bus is a greater danger than the tramcar. The traffic manager of the Glasgow Tramways is even more emphatic, asserting that the tramcar running on a fixed rail is the safest vehicle of the streets. The head constable of Liverpool also regards tramways as less dangerous than motor-bus services, and the chief constable of Birmingham, too, refuses to admit that traffic dangers are due to tramcars exclusively, saying that accidents in busy streets would be as numerous if there were no tramways.

The revenue account of the Manchester Corporation Tramways shows an income of £925,309 as compared with £887,646 in the previous year. The working expenses were £585,223. The financial results per car mile show the revenue to be 11.410d., as against 11.351d. in 1912 and 1913. The working expenses were 7.216d., as against 7.132d. The increase in the traffic expenses is accounted for by the increased scale of wages adopted for nearly all grades of labor chargeable to this account. The consumption of electrical energy per car mile shows a further decrease, notwithstanding the increased number of cars fitted with top covers. Commenting upon the reduction of fares, the report states that the effect of the change was found in the increase of 17,933,558 in the number of passengers carried—205,608,741 against 187,675,183. The number of parcels carried on tramway-cars last year was 1,303,353, as compared with 1,189,143 the previous year. The total profits in this department were £3,641. The first year's profits in 1907 were £265. There are now 662 cars ready for service.

A. C. S.

News of Electric Railways

Deficit Predicted for Washington Roads Under Municipal Ownership

Clarence P. King, president of the Washington Railway & Electric Company, has made public figures which indicate that the passage of the Crosser bill for the government ownership of the electric railways of Washington, D. C., would cause an annual deficit of at least $1,000,000. The computation upon which Mr. King's figures are based is as follows:

Market value on June 15, of securities of Capital Traction Company and Washington Railway & Electric Company	$48,483,617
Minimum estimated District of Columbia bond issue	50,000,000
Interest on district bonds at 3.65 per cent	1,825,000
Necessary for sinking fund per annum	1,000,000
Total fixed charge	$2,825,000
Net revenue of two roads after operating expenses, taxes, but not interest, 1913	2,263,374
Minimum estimated deficit	$561,626

Mr. King has based his figures upon the expectation that the condemnation would approximate the present market value of the securities of the lines. As the district bonds are to be a lien only upon the actual income of the railroad properties, it has been assumed that the bonds will have to be sold below par. The $2,263,374 net revenue for 1913 represents the net earnings of the lines after paying operating expenses and taxes, but not the interest on the bonds. The $1,000,000 sinking fund item is worked out on a basis provided in the bill that the commissioners of the District shall set aside each year for twenty-seven years a sum sufficient when invested to redeem the bonds at maturity.

A favorable report on the Crosser bill has been ordered by the District committee of the House of Representatives, and it was promised that an attempt would be made in the House on June 22 to call the bill up for action. The district day on the House calendar, however, was displaced to make way for the sundry civil appropriation bill. The next District day will be July 5, and that probably will be displaced by the July 4 holiday.

New York Subway Construction Contracts

The Public Service Commission for the First District of New York will soon advertise for bids for the construction of Section No. 5 of Routes Nos. 4 and 36, the crosstown portion of the Broadway-Seventh Avenue and Fifty-ninth Street subway. Bids will be opened on July 24. The Broadway subway, which is to be operated by the New York Municipal Railway Corporation, runs up Broadway to Forty-second Street, where it crosses underneath the existing subway and continues up Seventh Avenue to Fifty-ninth Street. Here the four-track construction ends, but two tracks curve to the eastward and run to and over the Queensboro Bridge to a connection with the new rapid transit lines in Queens.

A public hearing will be held July 23 before the commission upon the terms and conditions of the proposed contract for the construction of Section No. 3 of Route No. 33, the Whitehall-Montague Street subway and tunnel line, for operation by the New York Municipal Railway Corporation. The contract for the Manhattan end of this line, as well as for the tunnel under the East River, has already been let. After the public hearing is held the commission will put the contract in permanent form and advertise for bids for construction.

The commission in a few days will advertise for bids for the finish work in six stations on the extension of the Fourth Avenue subway in Brooklyn between Fortieth and Ninetieth Streets. Bids will be opened on July 23. The work to be done includes everything necessary to complete the stations and station approaches.

Bids for making borings along the lines of proposed rapid transit railroads in Manhattan, Brooklyn, Queens and The Bronx will be opened by the commission on July 10. This contract will include both land and river borings.

Coalition of American Cities to Combat Corporations

A coalition of five representative American cities has already been effected, which, in the words of the promoters, will "fight the combination of municipal utility corporations, big and little, that has for a generation operated to thwart municipal progress and growth." Mayor Blankenburg of Philadelphia conceived the plan of campaign. Those who have approved the movement include Mayor Mitchel, of New York; Mayor Harrison, of Chicago; Mayor Baker, of Cleveland, and Mayor Shroyer, of Dayton, Ohio. A conference is to be held this fall in Philadelphia, when a permanent organization will be established. A letter has been sent from Philadelphia to mayors of cities throughout America, setting forth the need of such an organization and inviting them to participate in the conference. This letter, signed by Mayor Blankenburg, follows:

"The city of Philadelphia is preparing to bring, in the early autumn, a case before our new Public Service Commission, in which that body will be asked to pass upon a proper schedule of rates for electric light and power. In the course of our investigations and reviews of hearings on this subject, we have come to realize that the side of the people has seldom, if ever, been adequately presented before other public service commissions, while the interests of the public utility companies are presented and argued by the best informed and most able men in the country. If the cities do not join for the presentation of their cases as the public utility companies have, the laws and precedents established by the commissions stand in danger of being biased by the able arguments of the representatives of these corporations.

"The equipment required for an adequate presentation of the rights and interests of the people involves a degree and extent of technical knowledge and information which it is not practicable for any one city to obtain. This knowledge and information is much the same for each city, and its cumulative use would greatly add to its value. It must be borne in mind that the utility companies constitute themselves an offensive and defensive alliance, probably stronger than any other interest in this country. Its weakest member is never without information and assistance of every kind.

"To meet this situation it has been suggested that there should be formed a bureau of public utilities research which shall equip itself to give to the cities the same able assistance which the public utility companies' associations give to the public utility companies, thus in effect constituting an offensive and defensive alliance among the cities similar to that existing among public utility corporations.

"To this end we are preparing to form a permanent organization of this character. I am writing to you to ascertain your interest in this matter and to ask whether you would be represented at a nation-wide conference of city officials to be held in this city in the autumn to discuss the various phases of public utility problems as affecting the people, and how they may best be dealt with.

"Mayor Mitchel, of New York; Mayor Harrison, of Chicago; Mayor Baker, of Cleveland, and Mayor Shroyer, of Dayton, join me in making this inquiry. Mayor Mitchel and Mayor Harrison will personally represent New York and Chicago at this conference. We are confident that the result will be a great step forward in the matter of securing a proper presentation of the people's side in utility cases."

In discussing his plans, Mayor Blankenburg said:

"We believe most heartily in the principle of regulation through public service commissions, and we want to cooperate with the commissions by presenting the citizens' side at their hearings as effectively as the corporation side has been presented in the past, so that these commissions will not be placed in the rather unfair position of having to judge a situation where only one side is adequately presented. We hope and expect that through public service commissions the problems now rising in regard to public utilities are going to be adjusted to the satisfaction of all concerned. The sooner the people's side of the question

is adequately and fairly presented before these commissions, the sooner they will come to some final and permanent standard of decisions. We believe that the proposed bureau of public utilities research should be purely a people's institution, with no leading strings of any kind attached to it. It will be at the service of all citizens and mayors and city officials everywhere. Even the tax rate is of interest only to those who have property to be taxed. But the service rendered and the rate charged for gas, electricity, water and street cars reaches and affects every single individual in the entire city, and it affects with special force those of moderate incomes. I feel that we have been slow in recognizing this responsibility and responding to it. No officers have yet been elected for the proposed bureau of public utilities research nor have the details of the organization been worked out. It is expected that every city of any considerable size in the country will be represented at the convention this fall. The bureau is for the present being financed by some private individuals."

Preparing for the Kansas City Franchise Vote

The extension of the franchise of the Metropolitan Street Railway, Kansas City, Mo., to be voted on July 7, was recently endorsed by the Kansas City Commercial Club, the leading commercial body, by a vote of 330 to 36. The Real Estate Board, the German-American Alliance and other organizations already had come out in favor of the grant.

In anticipation of the election, 208 canvassers were recently appointed to cover the city and ascertain how many voters have been disqualified by moving and in other ways. The company waived the right to appoint the canvassers, each of whom will be paid $4 a day. This expense, however, will be borne by the company.

The attitude of labor on the franchise is indefinite. Newspapers adverse to the measure have attempted to create unfavorable sentiment among the laboring classes by alleged misquotations. Those favoring the grant, on the other hand, have given publicity to the receivers' statements as to their position and assurances that labor will receive a fair hearing.

Paid advertisements were run recently by a group of leading business men calling attention to a meeting held at the Baltimore Hotel. At that gathering sentiment was distinctly favorable to the extension, most of the speakers asserting that business in general is being retarded by the unsettled conditions regarding the street railway. Anti-franchise meetings on the streets have been held by labor agitators, aroused over the failure of employees of the company to organize before the holding of the election.

Judge W. C. Hook of the United States District Court has advised the company's creditors to accept the proposed franchise. Philip J. Kealy, and others interested, have spoken before the City Club and other organizations, answering objections to the franchise and otherwise outlining the company's position.

The Metropolitan Street Railway has been active in other respects. The Kansas City *Star*, a bitter opponent of the franchise, recently hit upon the idea of creating interest in the election on July 7 by running numerous placards through the paper: "Kansas City's Day, Tuesday, July 7." The company was so favorably impressed by this line of action that it has equipped all of its cars with the same slogans, similar to the productions of the *Star*. Script was used in the signs instead of ordinary lettering. The street railway secured the reproduction by photographing and enlarging the newspaper's signs.

In addition, the company has placed boxes in all cars containing copies of three bulletins which have been issued. The brochures discuss the franchise, answering all questions asked the company and analyzing the salient points of the contract.

The Kansas City Railways, which will take over the system in Kansas City if the franchise is passed, has filed an application with the Missouri Public Utilities Commission for authority to issue $5,000 additional common stock. The application was filed by Frank Hagerman, attorney for the receivers.

Every precaution is being taken to insure a fair election on July 7.

Wage Agreement Modification in Cleveland

J. J. Stanley, president of the Cleveland (Ohio) Railway, announced to a committee representing the local branch of the Amalgamated Association of Street & Electric Railway Employees on June 24, that he could not consent to their demand for an eight-hour minimum day. He told the men, however, that he was willing to increase the wages of the men who have been with the company more than a year from 30 to 31 cents an hour and fix a minimum day of five hours. Estimates made by the company show that the change in the schedules, with a minimum day of eight hours, would increase the operating expenses $321,000 a year. According to the estimates of the union the increase would be $527,000 a year. Mr. Stanley said that an increase of from $125,000 to $140,000 per year is all that he was willing to grant and that the figures he mentioned would just about cover this.

The following day the committee called upon Peter Witt, street railway commissioner. He told them that he had had in mind an increase of $150,000 a year as a maximum and that he would not be willing to recommend a greater amount.

The committee did not accept Mr. Stanley's proposition, but stated that the schedules would be gone over to see if any change can be made in them that will bring the total figures to approximate those mentioned by Mr. Stanley.

It is said that if the demands are granted the fare would have to be advanced to 4 and possibly to 5 cents. Mr. Witt feels that he cannot recommend anything that will result in an advance in the fare.

The conductors and motormen have arranged to vote upon the proposition made by Mr. Stanley relative to new schedules and wages for the men. The conditions imposed are that the revised schedules, as prepared by the subcommittee, be made the forms of schedules after which all future schedules shall be made; that all present schedules be revised to comply with these forms on the conclusion of this agreement; that all the runs in future schedules which do not furnish trainmen five hours or more time on any calendar day pay five hours' time; that trainmen who are called upon to work a run of less than five hours will, whenever called upon by the dispatchers, do other work to the extent of five hours without extra compensation, but should the work require more than five hours, pay be made for the actual time employed; that the rate of pay for conductors and motormen who have been in the employ of the company less than one year be 27 cents per hour and for those who have been in its employ one year or more be 31 cents an hour. The proposal depends upon the city's action in granting an increase in the operating expenses sufficient to meet the cost imposed by the new agreement.

The Salem Fire

A conflagration resulting in an estimated loss of $10,000,000 occurred at Salem, Mass., on the afternoon and evening of June 25. The fire rendered about 20,000 persons homeless and consumed approximately 1000 buildings, sweeping the shoe and leather district and many residential streets. Early in the evening the city was placed under martial law, and although dynamite was freely used to check the flames, strong and shifting winds carried the fire over an area about 1.5 miles long and 0.5 mile wide. The loss of life was small.

The damage to the property of the Bay State Street Railway was confined to the overhead system and the wharf of the maintenance of way department. The company carried thousands of refugees and sightseers. Several hours after the fire started it became necessary to cut the cables serving the main lines of track entering the city from the south and west, and cars were then run only to the Salem High School. The next afternoon cars were again operated to the center of the city, temporary feeders having been erected. On Sunday the company handled the largest local traffic in its history. The Boston Elevated Railway, the Bay State Street Railway and the Boston & Worcester Street Railway carried several companies of militia to the scene of the fire early on June 25, and all these transportation organizations have since handled supplies for the sufferers free of charge.

Action Unlikely in Connecticut Mail Case

The post-office department will continue its experiment with automobiles in transporting mail in Connecticut for an indefinite period, according to information given out at the office of the Second Assistant Postmaster-General at Washington, in relation to the refusal of the Connecticut Company to continue the service. The post-office authorities will make no effort to have the company re-establish its mail service, even though the government claims that the contract with the company had not expired. As previously stated in the ELECTRIC RAILWAY JOURNAL the company asked to be relieved of side and terminal service at fifty-four stations, and also wanted the number of mail pouches to be carried on any one trip limited to six. The post-office department offered an increase in pay and to relieve the company of side and terminal service at thirty points, but was unwilling to yield on the number of pouches to be carried, in as much as such a course would probably mean a delay in delivery. The company therefore discontinued the service.

New Power Station for New Jersey System

Public Service Corporation of New Jersey, Newark, has preliminary work under way for the construction of a large power station at Point-no-Point on the Passaic River. The site, which is located about 2000 ft. north of the Plank Road, has an area of 16 acres and the plant will be known as the Essex Station as it is intended to take care of the business in the county whose name it will bear. The ultimate capacity of the plant will, according to the present plans, be 150,000 kw. It is not intended, however, to build the plant to capacity at once but something like $2,000,000 will be spent within a year and the station will be so designed that it can be enlarged to meet the demands of future growth.

Much has already been done in the way of preparing the ground and securing data to pave the way for the awarding of contracts. As the land was practically inaccessible for business purposes the company built a road, about 2000 ft. long, from Blanchard Street to the property. This was constructed of broken stone and cinders, on a foundation of old poles and railway ties laid crosswise on the meadows mud, and the whole forming a highway capable of supporting heavy trucking. A spur of the Manufacturers Branch Railroad has also been laid across the site to what will be the turbine room. Twenty-seven test piles, ranging in length from thirty-five to fifty-five feet have been driven to determine the resistance of the soil and water borings were made to provide data upon which to base specifications for foundation and dock contracts. The tests have shown a depth of 9 ft. of marsh mud, underneath which were 2 ft. of mud, 12 ft. of sand, 2 ft. of gravel, 14 ft. of red sand, 4 ft. of clay and 2 ft. of rock for a total depth of 45 ft.

Proposals have been invited for the building of a dock which will have a total length of 682 ft. and extend from the pier head line back to the present high water mark, a distance of about 65 ft. Contractors have been asked to submit alternate figures for three different types of docks, concrete, timber crib and a combination of concrete and timber crib. The top of the dock is to be 30 ft. above the bottom of the government channel and the solid portion of the structure will be 16 ft. wide. Behind that the space will be filled with material dredged from the river as the company will provide itself with a depth of 10 ft. at its proposed dock with the depth sloping to the present 20-ft. channel in the river. The top of the dock will be 18 in. above the highest flood tide mark of which there is any record and the foundation of the station will be as high to preclude probability of trouble from high water.

Intakes for condensing water will be built through the dock and the latter will be arranged to accommodate the coal handling machinery. Incidentally the company will have the water route and two railroads to carry its coal supplies and there will be coal storage facilities sufficient to take care of all the company's power stations in the northern part of the State, if necessary or desirable.

It is proposed to build the station on a line with the outermost point of the present land, that is to construct it on foundations laid between the existing high and low water marks. In its finished state the building will be 366 x 285 ft. but the intention is to get along with a structure 366 x 154 ft. until such time as an addition will be necessary. There will be a turbine room, a boiler house and a switch house. Two turbines of 25,000 kw capacity each will be installed leaving room for a third and at the outset space will be provided for eight boilers although only four will be set up. It is expected that bids will be asked for the foundations early in August and that the plant will be in operation in the late summer or early fall of next year.

Mr. Mellen's Hopeless Tangle

Everybody's Magazine for July contains an illustrated interview by Garet Garrett with Charles S. Mellen, former president of the New York, New Haven & Hartford Railroad. Mr. Mellen states that the acquisition of the electric railways estranged public sentiment more than anything else the New Haven did. In this connection Mr. Mellen is quoted as follows:

"I was trying to secure control of the trolleys contiguous to the lines of the New Haven because I had the theory and belief that, first, all railroads were going sooner or later, especially in congested communities, to be operated by electricity. Then there was a great economy in the erection of large units in the way of power houses to furnish the electricity for both systems of transportation. It is my conviction that the beginning of government ownership of railways is almost imminent in this country. But I said to myself: 'Though that is so near at hand, it will be many years before public sentiment will submit to government ownership of street railways.' Therefore I proceeded to tie the New Haven Railroad and its electric railways so tight that it would be very hard ever to untie them. I made street railway mortgages that were also a lien on a part of the New Haven Railroad, and then railroad mortgages that were also a lien on parts of street railway systems, saying to myself as I did it: 'Now when they come to New England with their schemes for government ownership of railroads they will look it over and lift up their hands in despair. They can't take the railroads without the trolleys, and the public will not stand for their taking both.' The result is that now the department of justice is in despair. It is a hopeless tangle, as I intended it should be."

St. Paul Electrification Progress

C. A. Goodnow, assistant to the president of the Chicago, Milwaukee & St. Paul Railway, made the following statement about electrification at Great Falls, Mont., recently:

"My first purpose on this visit to Great Falls is to get things started toward the electrification of our terminals in Great Falls in order that we may keep our word with the city that the work would be completed by Jan. 1, 1915. Electrification of the terminals will be under Mr. Beeuwkes, our electrical engineer in charge of electrifying our main line between Avery, Idaho, and Harlowton. The exact time of starting actual construction could hardly be fixed now because there are a mass of details that must be worked out.

"There has been some disappointment on our part in the fact that the construction of our passenger station at Great Falls has not gone forward as rapidly as we had hoped. The delay has been due to hindrances in getting the brick needed, but we hope now the work will be pushed with all possible speed until the station has been completed. Ballasting the line is going forward quite satisfactorily just now. New grades do not stand spring freshets well and there has been some trouble between Great Falls and Lewistown. However, we shall have no difficulty, we now believe, in getting the road ballasted and opened to scheduled service by Aug. 1.

"Concerning the electrification of the main line which is in charge of Mr. Beeuwkes, there is only the best report. The trolley poles and the transmission poles are arriving in plentiful quantity and are being set promptly, so we are certain not to be delayed from that source. As has been announced, the plans and specifications for the locomotives, and the equipment which will be needed in the substations

and in other ways in making the change to electric power are now in the hands of the manufacturers. Naturally, with assurance of being ready so far as the installation of the trolley and transmission lines by the time we have set, Jan. 1, we shall hope to get the equipment as nearly on time as the makers can deliver it, but until the bids have been opened it would hardly be wise to predict what the bidders will offer on the time for delivery. It is a safe prediction, it seems to me, to say the date of actual operation by electricity will not be delayed long, if at all, beyond Jan. 1, 1915."

Chicago Engineer Removed by Mayor Harrison

By a vote of forty-one to eighteen, with six Aldermen excused from voting, the Chicago City Council on June 29 concurred in Mayor Harrison's removal of George Weston as the city's representative on the board of supervising engineers. Mr. Weston still holds the position of chief engineer of the board.

The transportation committee of the City Council inquired on June 30 into the methods of procedure followed by the board of supervising engineers. Walter L. Fisher appeared as counsel for the board. Corporation Counsel Sexton conducted the inquiry for the committee. Both B. J. Arnold and Mr. Weston were examined. During the inquiry Mr. Sexton asked the board to produce the complete record of opinions furnished to the board by the Corporation Counsel. Both Mr. Fisher and Alderman Capitain were in favor of having the investigation disposed of as soon as possible. The members of the committee, however, determined to defer until fall all further consideration of the accounting charges against the board. Mr. Arnold and some of the other Aldermen also protested against the postponement of the launching of a new investigation before the pending charges had been disposed of. In this connection, Alderman Capitain said that he wanted to criticise the parties that submitted the order—the same parties that appealed to the Council for $50,000 for a new audit.

At the suggestion of the Mayor the City Council has referred to the finance committee the Mayor's request for an appropriation of $50,000 for a new audit of the street railway companies' books.

Chicago advices state that Mayor Harrison has decided to appoint Edward W. Bemis, public utility expert, as the city's representative on the board of supervising engineers to succeed Mr. Weston.

Toledo Citizens' Franchise Considered Informally

A meeting of the special franchise committee of the City Council of Toledo, Ohio, was held on the evening of June 30. The franchise submitted by the Toledo Citizens' Franchise Association was discussed. Mayor Carl H. Keller was in Columbus, City Solicitor Thurstin remained only a few minutes when he found that no official discussion was to take place.

J. R. Cowell, representing the Non-Partisan League, has announced that his organization will have a franchise proposal ready for submission soon. This proposal, it is understood, will be similar to the franchise of the Cleveland Railway. The Non-Partisan League is operating on the idea that municipal ownership will be the ultimate end, but that the city is not yet ready to take over the properties of the Toledo Railways & Light Company. The franchise committee has informed Mr. Cowell that it will be glad to consider any proposition that is likely to hasten a settlement of the franchise question.

Frank L. Mulholland, of the Citizens' Franchise Association, requested the committee to fix upon an early date for a meeting to take up the negotiations on the proposed franchise. It was decided to hold a joint conference of the franchise committee of the City Council and the Citizens' Franchise Association on July 2.

The impression prevails that if the franchise committee does not recommend some action to Council within a short time steps will be taken to initiate the proposal of the Citizens' Franchise Association and get it before the voters. Councilman F. M. Dotson is quoted as saying that negotiations with the company will be continued no matter what other movements are inaugurated.

The Municipal Ownership League filed petitions containing 8000 names with the City Auditor on June 30, asking that its proposal be submitted to the voters. This organization proposes to issue $8,000,000 of bonds with the proceeds of which the city is to purchase the railway, lighting, power, gas and heating properties of the Toledo Railways & Light Company. The Municipal Ownership League favors the immediate acquisition of the railway properties by the city and is pledged strictly to support that plan.

It seems likely that there will soon be a three-cornered effort to settle the question under way, but it is believed the business men's proposition is so strongly supported that it will of necessity take preference over all others in the order in which they are taken up for consideration.

The company has done little the last two weeks toward a settlement. Mr. Doherty and the officials are waiting for developments from the efforts made by the Toledo Citizens' Franchise Association before taking further steps. It is the intention to afford every opportunity to the city to work out a satisfactory proposition, since the plan presented in behalf of the company did not meet the approval of the administration. The company, however, looks to the city to follow out the mutual understanding arrived at when the company suspended its order to collect the old rate of fare and proceed in earnest to reach a settlement.

Henry L. Doherty has been in New York for a week. This is the first time he has been absent from Toledo in more than three months. He was expected to return on July 1.

Even if the city should vote in favor of municipal ownership, following the petition filed with the auditor, Councilman Dotson explained that it will be necessary to extend the present franchise. Several years would be required, he said, to take over the properties.

Westinghouse Strike Situation

A company of the State Constabulary of Pennsylvania went to East Pittsburgh on June 29 for the purpose of assisting in the maintenance of order in the district affected by the strike of employees of the Westinghouse Electric & Manufacturing Company. The State Constabulary were sent at the request of Sheriff Richards, of Allegheny County, made after a demonstration by strikers which threatened disorder.

Employees of the Union Switch & Signal Company who walked out on June 12 have returned to work. Col. H. G. Prout, president of this company, in announcing that all the men had returned to work, said:

"This walkout was an Industrial Workers of the World effort thinly disguised, and the men went out without presenting any grievances, demands or requests. No concessions whatever have been made by the company."

I. C. C. Report Concerning New Haven Railroad.—It is reported that the findings of the Interstate Commerce Commission in response to the resolution of the Senate authorizing its recent investigation of the New York, New Haven & Hartford Railroad will be submitted to the Senate within the next two weeks.

Striking Employees of Kansas Road Return to Work.—Five former employees of the Union Traction Company, Coffeyville, Kan., who went out on a strike on March 31, have applied for reinstatement. The company accepted their applications as individuals, declining to recognize the union. Other men are expected to return shortly.

Extension of Time Granted.—The Public Service Commission of the First District of New York has granted the Hudson & Manhattan Railroad an extension of time from June 28 to Oct. 1, 1914, within which to begin the construction of the extension of its system from Thirty-third Street and Sixth Avenue, New York, to the Grand Central Station at Vanderbilt Avenue and Forty-second Street.

Proposed Radical Action in Pittsburgh Not Approved.—Councilman G. A. Dillinger, of Pittsburgh, on June 16 presented a resolution in the City Council, instructing the city law department to take steps to force the Pittsburgh Railways into the hands of a receiver. Several days previously the Mayor and the Council had agreed to let the law depart-

ment compile all the complaints against the company and then take them up with the company. The Council, on June 24, postponed action on the Dillinger resolution for a week.

Ohio Tax Valuations.—The net increase in valuation on all street, suburban and interurban railways in Ohio, as reported by the tax commission, is $4,834,890 over last year. The total valuation of all properties is $145,476,000. The largest increase was imposed on the Cleveland Railway, which some time ago brought an injunction suit against the treasurer of Cuyahoga County to prevent the collection on all valuation over a certain amount. The increase for the Columbus Railway, Light & Power Company was about $553,000.

Small Line Abandoned.—It has been decided to abandon the line of the Orange Mountain Traction Company, West Orange, N. J., which operates from the foot to the top of Orange Mountain, a distance of 1½ miles. The system was installed about six years ago and has never been operated at a profit. The decision to abandon the property was reached on account of the inability of the company to secure an extension of its rights so as to permit it to discharge passengers near the station of the Delaware, Lackawanna & Western Railroad in West Orange. The town of West Orange has since bought in the property to satisfy $1,500 in taxes past due.

Indianapolis Business Men Visit Utilities.—Five hundred business men of Indianapolis took the fourth industrial excursion Saturday afternoon, June 20, and visited the property of five public utilities corporations. The excursion was under the auspices of the municipal development division of the Indianapolis Chamber of Commerce. The first visit was to the Tenth Street power station of the Terre Haute, Indianapolis & Eastern Traction Company. Robert I. Todd, president of the company, addressed the visitors at the plant. Other utilities visited were the works of the Indianapolis Water Company, the Langsdale Avenue plant of the Citizen's Gas Company, the Mill Street plant of the Indianapolis Light & Heat Company and the Washington Avenue plant of the Merchant's Light & Heat Company.

New York State Railways to Arbitrate Wage Question.—Employees and officials of the New York State Railways have agreed to arbitrate the question of whether wages shall be increased. This arrangement is in compliance with the agreement effective on May 1, 1914, and continuing until May 1, 1915, which covers all new working conditions, with the provision that if the two parties concerned cannot agree upon wages the matter shall be left to arbitration. Two of the three arbitrators have already been selected. Thomas Spratt, Ogdensburg, N. Y., will represent the company and James E. Roach, Schenectady, N. Y., the employees. Both sides have agreed to ask Charles P. Neil, New York, N. Y., formerly United States Commissioner of Labor, to accept the position of third arbitrator. It is not yet known whether Mr. Neil will accept this position as he is away in the West at present. He is, however, expected home shortly.

Bankers Inspect Chicago Elevated Railways.—The property of the Chicago (Ill.) Elevated Railways was inspected on June 22 by the representative of the banking firms which were members of the syndicate which underwrote the $12,500,000 of first mortgage 5 per cent bonds of the Northwestern Elevated Railroad. The members of the party, which also included a number of bankers who participated indirectly in the underwriting, made the trip from New York and Boston on a special section of the Twentieth Century Limited which left New York on Sunday forenoon, June 21, and returned to the East on the Twentieth Century Limited, leaving Chicago at noon on Tuesday, June 23. The inspection trip started from Fifth Avenue terminal of the Metropolitan West Side Elevated Railway at 11.10 a. m. The itinerary was west over the Garfield Park branch of the Metropolitan Elevated to Forest Park, thence downtown and to the Jackson Park terminal of the South Side Elevated Railway and thence north to the Wilmette terminal of the Northwestern Railway. On the return trip the Ravenswood branch was inspected. Luncheon was served en route. After the inspection of the elevated lines the guests were taken by automobile to the plant of the Commonwealth Edison Company, by which the elevated railway is supplied with power.

Financial and Corporate

Stock and Money Markets

June 30, 1914.

In the early trading on the New York Stock Exchange to-day a weak tone was shown. Good buying, however, followed the recessions at the opening of the market with the result that there was an abrupt change in the market tendency. In the last half of the day the range of prices was unusually high. Nearly all the important issues were up one point or more at the close. Rates in the money market to-day were: Call, 2 per cent; sixty days, 2½ per cent; four months, 3 per cent; six months, 3½@3¾ per cent.

In Philadelphia to-day most of the local issues ruled fractionally weaker and were in very light demand.

The Chicago market was broader to-day and firm. The volume of sales was small, however. Bonds were steady and in fair demand.

The Boston market was dull to-day. Prices advanced all along the line, however, and were best at the close.

The Baltimore market was narrow and inactive to-day. Sales of stock totaled 2550 shares, mostly Elkhorn Fuel common. Bond transactions totaled $30,700, par value.

Quotations of traction and manufacturing securities as compared with last week follow:

	June 24	July 1
American Brake Shoe & Foundry (com.)	88⅛	88⅛
American Brake Shoe & Foundry (pref.)	134	134
American Cities Company (com.)	*29	*29
American Cities Company (pref.)	*65¼	60
American Light & Traction Company (com.)	341	339
American Light & Traction Company (pref.)	109	109
American Railways Company	37⅜	37
Aurora, Elgin & Chicago Railroad (com.)	34	a35
Aurora, Elgin & Chicago Railroad (pref.)	76	78½
Boston Elevated Railway	90¾	91½
Boston Suburban Electric Companies (com.)	7	7
Boston Suburban Electric Companies (pref.)	*65	65
Boston & Worcester Electric Companies (com.)	*6¼	*6¼
Boston & Worcester Electric Companies (pref.)	35	35
Brooklyn Rapid Transit Company	90	91
Capital Traction Company, Washington	97	96
Chicago City Railway	135	135
Chicago Elevated Railways (com.)	25	20
Chicago Elevated Railways (pref.)	75	65
Chicago Railways, ptcptg., ctf. 1	99	97
Chicago Railways, ptcptg., ctf. 2	34	34¼
Chicago Railways, ptcptg., ctf. 3	6	5
Chicago Railways, ptcptg., ctf. 4	2½	2
Cincinnati Street Railway	105	101½
Cleveland Railway	103¾	103⅞
Cleveland, Southwestern & Columbus Ry. (com.)	*4	*4
Cleveland, Southwestern & Columbus Ry. (pref.)	*30	*30
Columbus Railway & Light Company	13	13
Columbus Railway (com.)	*53	*53
Columbus Railway (pref.)	79½	79½
Denver & Northwestern Railway	*63	*63
Detroit United Railway	80	a80
General Electric Company	147½	147¼
Georgia Railway & Electric Company (com.)	120	120½
Georgia Railway & Electric Company (pref.)	86½	86⅞
Interborough-Metropolitan Company (com.)	14	14½
Interborough-Metropolitan Company (pref.)	61¼	61⅞
International Traction Company (com.)	*30	*30
International Traction Company (pref.)	*85	*85
Kansas City Railway & Light Company (com.)	22	*22
Kansas City Railway & Light Company (pref.)	39	*39
Lake Shore Electric Railway (com.)	*6	*6
Lake Shore Electric Railway (1st pref.)	*90	*90
Lake Shore Electric Railway (2d pref.)	*22	*22
Manhattan Railway	130	130
Massachusetts Electric Companies (com.)	11¼	11
Massachusetts Electric Companies (pref.)	56	56
Milwaukee Electric Ry. & Light Co. (pref.)	95	*95
Norfolk Railway & Light Company	*26	*26
North American Company	71	72¾
Northern Ohio Traction & Light Co. (com.)	a60	70
Northern Ohio Traction & Light Co. (pref.)	101	101
Philadelphia Company, Pittsburgh (com.)	39½	38¾
Philadelphia Company, Pittsburgh (pref.)	37	35
Philadelphia Rapid Transit Company	15¾	15
Portland Railway, Light & Power Company	*47	*47
Public Service Corporation	112	112
Third Avenue Railway, New York	41	41¼
Toledo Traction, Light & Power Co. (com.)	a13	20
Toledo Traction, Light & Power Co. (pref.)	70	*70
Twin City Rapid Transit Co., Minn. (com.)	103¼	103
Union Traction Company of Indiana (com.)	*11½	11½
Union Traction Company of Indiana (1st pref.)	*75	*75
Union Traction Company of Indiana (2d pref.)	*14	*14
United Rys. & Electric Company (Baltimore)	28	28¼
United Rys. Inv. Company (com.)	11	11½
United Rys. Inv. Company (pref.)	32½	32½
Virginia Railway & Power Company (pref.)	87½	87½
Washington Ry. & Electric Company (com.)	86	85½
Washington Ry. & Electric Company (pref.)	82½	83
West End Street Railway, Boston (com.)	66½	67
West End Street Railway, Boston (pref.)	85	85
Westinghouse Elec. & Mfg. Company	74⅝	73¾
Westinghouse Elec. & Mfg. Co. (1st pref.)	124	122

* Last sale. a Asked.

ANNUAL REPORT

Portland Railway, Light & Power Company

The comparative earnings statement of the Portland Railway, Light & Power Company, Portland, Ore., for the years ended Dec. 31, 1913 and 1912, follows:

	1913	1912
Gross earnings	$6,723,742	$6,642,308
Operating expenses (including taxes)	3,298,310	3,328,911
Net earnings	$3,425,432	$3,313,397
Interest	2,008,601	1,760,991
Surplus	$1,416,831	$1,552,406

The gross earnings of the company increased $81,434 during the year, or 1.2 per cent, while the operating expenses, including taxes, decreased $30,601, or 0.9 per cent, giving an increase in net earnings of $112,035, or 3.4 per cent. Interest charges increased 14.1 per cent, causing the surplus to decrease $135,575, or 8.7 per cent. There was available for depreciation renewals and dividends an amount equal to 5.7 per cent on the par value of the capital stock. The small increase in gross earnings was due principally to the business depression in the Pacific Northwest, although it was somewhat affected by the fact that comparison was made with a year during which revenues were received from the Salem Railway and the Williamette Falls Railway, both of which were sold in 1912. The operating ratio was reduced from 42.9 per cent to 42.5 per cent in 1913.

There was an increase in mileage per car per day on the city lines from 150 to 156, brought about through rerouting, alternate stops and the elimination of layovers. This caused a reduction in operating expenses per car mile sufficient practically to cover the increased wages of one cent an hour granted to the motorman and conductors. There was a heavy increase in fixed charges due to the completion of the Mt. Hood hydroelectric plant, and a transfer of the interest charge of this investment from the construction accounts to the operating accounts. Owing to the decrease of 8.7 per cent in the surplus, the dividend on the capital stock which had been paid at the rate of $5 per share per annum from December, 1912, was reduced to $4 per share per annum on Dec. 1, 1913.

Considerable construction work was done during the year, including the Mt. Hood plant at Bull Run, the Big Sandy diversion dam and the installation of a 7500-kw turbine. The electrification of the Mt. Hood Railway in July reduced the operating expenses and materially increased the business of the line. The electric business of the company was more widely developed during the year, as is shown by the fact that on Dec. 31, 1913, the company served 42,063 light and power customers, as compared with 38,415 in 1912. During the year $1,377,553 was charged to the construction account, of which $542,081 was for railway extensions and improvements, $68,401 for new cars, $60,736 for carhouses and $208,201 for power plant, substations and transmission lines. The above total is slightly less than for the average capital expenditures made during the years 1906 to 1912, inclusive. The item for new cars covered the purchase of four passenger cars and twenty freight cars.

The report states that during the year the application of scientific management was continued, covering the operation of the light and power department, the railway shops and the maintenance of way department. Furthermore, it has been asserted by competent judges that the company has gone further with the introduction of efficiency principles than any other public utility corporation in the country. The results have been so satisfactory that the work is being extended to include practically all departments.

Pensacola Electric Company

The annual report of the Pensacola Electric Company, Pensacola, Fla., for the twelve months ended Dec. 31, 1913, shows gross earnings of $285,757, an increase of $328 over 1912. These total earnings were divided $145,520 to the railway department, a decrease of $7,693, and $140,237 to the light and power department, an increase of $8,021. The operating expenses were $172,196, an increase of $5,754 over those of 1912, and taxes amounted to $10,542, an increase of $525. The net earnings of $103,020 were a decrease of $5,950 from those of the preceding year. Interest charges increased $4,718, which, with the dividends, prior surplus and replacement reserve, gave a current surplus of $43,174, a decrease of $3,806. The percentage of operating expenses, not including taxes, to the gross revenues was 60.3 in 1913, comparing with 58.3 in 1912, 59 in 1911, 58.4 in 1910, 57.3 in 1909 and 69.2 in 1908. The number of passengers carried during the year, including transfers, amounted to 3,116,615. The number of transfers taken up showed a total of 511,229.

American Cities Company

The income, profit and loss statement of the American Cities Company, New York, N. Y., for the twelve months ended Dec. 31, 1913, is as follows:

Dividends on stocks owned	$1,809,162
Interest on debentures owned	5,676
Interest on bank balances	10,447
Interest on notes and accounts receivable	23,442
Contract for services	1,583
Total receipts	$1,850,310
Operating expenses and taxes	57,624
Net earnings	$1,792,686
Interest on collateral trust gold bonds	500,000
Net income	$1,292,686
Dividends on preferred stock, 6 per cent	1,233,210
Surplus for period	$59,476
Surplus Jan. 1, 1913	135,518
Surplus Jan. 1, 1914	$194,994

The annual report states that the income of the company as set forth above is wholly from dividends declared and paid on stocks of the various constituent companies except the comparatively small amount received as interest upon loans and cash balances. If the proportionate interest of the American Cities Company in the undivided earnings of the constituent companies were added to the surplus earnings as shown above, the results for the year 1913 would be $255,194, an equivalent rate on the common stock of the American Cities Company of 1.5 per cent. The American Cities Company now owns in the aggregate 85.83 per cent of the preferred and 94.51 per cent of the common stock of the following companies: New Orleans Railway & Light Company, Birmingham Railway, Light & Power Company, Memphis Railway, Little Rock Railway & Electric Company, Knoxville Railway & Light Company and Houston Lighting & Power Company.

The combined comparative income statement for these constituent companies for the years ended Dec. 31, 1913 and 1912, follows:

	1913	1912
Gross earnings, all sources	$14,680,302	$13,878,961
Operating expenses and taxes	9,117,986	8,179,079
Net earnings	$5,562,316	$5,699,882
Interest, bond discount, amortization and miscellaneous	3,347,799	3,168,333
Amounts applicable to dividends on stocks	$2,214,517	$2,531,549

The gross earnings of the constituent companies increased at a rate of 5.8 per cent during 1913; the operating expenses and taxes, 11.4, and deductions, including interest charges, 5.6 per cent, leaving a decrease in net corporate income of 14.3 per cent. In commenting upon this showing, the report notes that during the year the Little Rock Railway & Electric Company reduced its electric light and power rates, the Birmingham Railway, Light & Power Company its gas and electric rates and the New Orleans Railway & Light Company its gas and electric rates. The increase in operating expenses and taxes was due largely to the increased percentage of operating revenue allowed for the maintenance of the constituent companies in addition to the sum which would have been derived from the increase in operating revenue. This aggregated $130,000, or approximately 1.6 per cent of the total operating expenses of the constituent companies. The taxes on the New Orleans Railway & Light Company, owing to a larger assessment, increased in an amount equal to 1.7 per cent of the total operating expenses and taxes. The operating expenses of the Houston Lighting & Power Company increased 0.75 per cent on account of greater cost of fuel oil. The operating ratios of the constituent companies for the last four years are as follows: 1910, 53.30; 1911, 52.23; 1912, 51.64, and 1913, 53.67.

Columbus Refunding Mortgage Approved

At a meeting of the stockholders of the Columbus Railway, Power & Light Company, Columbus, Ohio, on June 29, the issue of $25,000,000 of 6 per cent first refunding mortgage bonds and $3,595,000 of prior preferred stock, bearing 4 per cent cumulative dividends, was authorized. The outstanding bonds of the constituent companies will be refunded as they mature with the new bonds, while the new stock is to be exchanged for the Columbus Railway 4 per cent bonds. The bonds to be refunded follow: $425,000 of Central Market Street Railway 5's, $3,000,000 of Columbus Railway first 5's, $572,000 of Crosstown Street Railway first 5's, $450,000 of Columbus Electric Company first 6's and $300,000 of Columbus Edison Company first 5's. After refunding these bonds there would remain unissued $20,253,000 of first refunding bonds. The capital liabilities outstanding would then consist of the $4,747,000 of bonds used for refunding, $3,595,000 of prior preferred stock, $1,143,500 of preferred series A, $4,066,500 of preferred series B and $6,340,000 of common stock.

E. W. Strong, Cincinnati, attorney representing a group of stockholders, objected to the amount of the bond issue and to the prior preferred stock. S. G. McMeen, president of the company, explained the purpose in refunding the present underlying bonds of the company and in providing for financing extensions and improvements. Mr. Strong made a motion to limit the authorized bond issue to $10,000,000 instead of $25,000,000, but this was defeated. He then moved to postpone action on the bond issue until July 20. In this he was also defeated.

Atlanta & Carolina Railway, Atlanta, Ga.—Roland Ransom has been appointed receiver of the Atlanta & Carolina Railway by Judge J. T. Pendleton in the Fulton Superior Court at Atlanta. The company was organized to build an electric railway between Atlanta and Augusta, but after constructing a short stretch of road it suspended operation in 1910 when a petition was made for a receiver. The demurrer against this petition was sustained by the Superior Court and later by the Supreme Court. The petition for a receiver on which action has now been taken by the court was filed only recently.

Fort Wayne & Springfield Railway, Decatur, Ind.—The property of the Fort Wayne & Springfield Railway was offered for sale a third time on June 22 at Decatur under foreclosure, but no bids were received. The upset price of the property was fixed by the court at $200,000.

Interborough-Metropolitan Company, New York, N. Y.—The $1,500,000 of 6 per cent notes of the Interborough-Metropolitan Company which matured on June 22 were paid off with money derived from the 5 per cent extra dividends recently declared by the Interborough Rapid Transit Company. The $1,936,942 of 6 per cent collateral trust notes which matured on July 1 were paid off with the proceeds from the sale of $1,500,000 of 5 per cent refunding mortgage bonds of the Twenty-third Street Railway, together with $500,000 of interest charges in arrears on the bonds. There are no further maturities until July 1, 1915, when the $4,000,000 of five-year 6 per cent notes fall due.

Interstate Railways, Camden, N. J.—John A. Rigg, president, and Thomas W. Grookett, Jr., treasurer of the Interstate Railways, have filed in the Court of Chancery of Trenton, N. J., an answer to the suit of Caleb F. Fox, a stockholder. Mr. Fox asked the court to restrain the defendants from paying to the company's bondholders such sums as the bondholders might have paid in release of certain bonds deposited with the Philadelphia Trust, Safe Deposit & Insurance Company. The answer of the defendants admits that the company was in a precarious financial condition in 1909. In June of that year $7,000,000 of bonds was deposited with the Philadelphia Trust, Safe Deposit & Insurance Company, as a depository for E. B. Smith & Company, Philadelphia, and a bondholders' committee, which was seeking to rehabilitate the company financially. It is further set out that the negotiations between Smith & Company and the bondholders' committee were abandoned on May 13, 1909. It is denied by the company that the Carson Estate controls the directorate of the defendant company. It is also denied that the rentals now received from the various properties of the company are insufficient to redeem and cancel certain preferred stock and to pay interest charges against the company, if the bondholders are compensated by the company for the payments which they made to secure the release of their securities. It is asserted that the Interstate Railways is now on a sound financial basis and that the efforts of the bondholders in 1909 have inured to the benefit of the complainant and the corporation.

Manchester Traction, Light & Power Company, Manchester, N. H.—The New Hampshire Public Service Commission has authorized the acquisition by the Manchester Traction, Light & Power Company of a controlling interest in the Nashua Light, Heat & Power Company. A transmission line will be built between the hydroelectric plants of the former and the steam plant of the latter, which are about 25 miles apart.

Marion, Bluffton & Eastern Traction Company, Bluffton, Ind.—The Marion & Bluffton Traction Company, the successor to the Marion, Bluffton & Eastern Traction Company, elected the following officers at a meeting of the directors on June 17, 1914: James W. Sale, president; Abram Simmons, vice-president; W. A. Patton, secretary and general manager; Dell Locke, treasurer. The following appointments have been made: James S. Clark, auditor, and George A. Redd, superintendent of transportation.

Minneapolis & Northern Railway, Minneapolis, Minn.—On petitions by George Heaton, president of the company, and of the Pittsburgh Coal Company, the Minneapolis & Northern Railway has been placed in the hands of the Minnesota Loan & Trust Company as receiver. On Jan. 26 five railroad contractors took over the line on liens amounting to $74,000, but the company was given a year in which to redeem the claims. The contractors, L. H. Boldue & Company, Leach & Mahoney, Belch & Company, Coolidge & Company and the Central Warehouse Lumber Company organized a separate company to extend the line to Mille Lacs, and this company, the Minneapolis, Mille Lacs & Northern Railway, will not be affected by the receivership.

Minster & Loramie Railway, Loramie, Ohio.—The Minster & Loramie Railway has been authorized to issue its common capital stock of the total par value of $42,700, and its new first mortgage 6 per cent bonds of the total sum of $20,000. The bonds are to be sold for the highest price obtainable, but for not less than 85. The common stock is to be issued in full exchange for the company's present outstanding issue of first mortgage bonds, of the total principal sum of $42,700. The proceeds arising from the sale of the new first mortgage bonds are to be devoted to pay and discharge present floating indebtedness.

New York, New Haven & Hartford Railroad, New Haven, Conn.—The directors of the New York, New Haven & Hartford Railroad and subsidiaries held meetings on June 25. Dividends were passed by the Rhode Island Company, by the Ontario & Western, and by the Housatonic Power Company. The official statement regarding the Rhode Island Company says: "No meeting of the Rhode Island Company board was held because it was deemed unwise to declare a dividend for that property. This has been a poor year for this property, which earned about 3 per cent on its stock, compared with 6 per cent a year ago. The difference is made up almost entirely from increase in wages and heavy expenses due to rebuilding the power house at Providence. This company, like the Connecticut Company, has a separate board of directors and officers with headquarters at Providence and is perfecting its operation."

Ontario West Shore Railway, Goderich, Ont.—The municipalities interested in the construction of the Ontario West Shore Railway have decided to advertise the road for sale by tender, on the understanding that the successful bidder, if any, shall complete the road from Goderich to Kincardine. In the event of the road not being sold as a whole the ties, bridge timber and other material will be sold separately.

Phillipsburg (N. J.) Horse Car Company.—The Phillipsburg Horse Car Company has certified to an increase in its capital stock from $30,000 to $430,000.

Public Service Corporation, Newark, N. J.—The Board of Public Utility Commissioners of New Jersey has authorized the Public Service Railway to extend for thirty years at 5 per cent the $300,000 of 6 per cent second general mortgage bonds of the Paterson Railway, which mature on Oct. 1, 1914.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—M. A. Andersen has filed a protest with the Railroad Commission of California against granting the application of the San Francisco-Oakland Terminal Railways for an order authorizing the issuance of bonds. Mr. Andersen is the owner of $62,000 of 5 per cent fifty-year sinking fund gold bond certificates of the United Properties Company. He alleges that these bond certificates were acquired in lieu of 5 per cent fifty-year sinking fund gold bonds of the United Properties Company, which it was represented were in course of preparation and would be delivered to the owners and holders of the certificates as soon as the bonds could be made ready. The United Properties Company, the complaint states, owned, at the time of issuing these certificates, a majority of the capital stock of the San Francisco-Oakland Terminal Railways, and it was agreed between the United Properties Company and the holders of the certificates that no prior lien would be placed upon this property. Subsequently, Mr. Andersen states, the United Properties Company, without his consent, transferred to others the stock of the San Francisco-Oakland Terminal Railways. The present holders of this stock are now seeking to issue bonds and Mr. Andersen is trying to prevent this action on the ground that it will cloud his title to an equitable first lien upon the properties of the United Properties Company.

United Railroads, San Francisco, Cal.—The annual meeting of the stockholders of the United Railroads has been called for July 14. At this meeting, which will be held three days before the date set for the inquiry into the affairs of the company by the State Railroad Commission, directors and officers will be elected for the ensuing year. Proxies have been forwarded to Jesse W. Lilienthal, president of the company, by Mason B. Starring, president of the California Railway & Power Company, the holding company of the United Railroads. In his letter to Mr. Lilienthal, Mr. Starring refers to the proposed inquiry into the affairs of the company by the Railroad Commission. He concludes his letter to Mr. Lilienthal as follows: "At this time I know of nothing more such stockholders can do than to send you proxies to be voted by you and with which you can establish yourself and your board in office for the ensuing year and further establish such policies for the United Railroads as in your judgment and others are best calculated to serve all interests."

Washington (D. C.) Interurban Railway.—Guy T. Scott and T. Howard Duckett have been appointed temporary receivers for the Washington Interurban Railway. Suit for the appointment of receivers was brought by the Railway Storage Battery Car Company on a promissory note for $15,957, on which judgment for $18,350 was confessed.

Youngstown & Ohio River Railroad, Leetonia, Ohio.—A quarterly dividend of 1 per cent has been paid on the $1,000,000 of 5 per cent preferred stock of the Youngstown & Ohio River Railroad. The dividends on this stock have been cumulative from July 1, 1903. Three-fourths of 1 per cent was paid on March 25 last, 1 per cent on Dec. 31 last, 1¼ per cent on Sept. 30, three-quarters of 1 per cent in June and March, 1913, and 1⅛ per cent, quarterly, in 1912.

Dividends Declared

Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., quarterly, 1½ per cent, preferred.

Bay State Street Railway, Boston, Mass., 3 per cent, first preferred; 2¼ per cent, common.

Birmingham Railway, Light & Power Company, Birmingham, Ala., 3 per cent, common and preferred.

Boston & Suburban Electric Companies, Newtonville, Mass., $1, preferred.

Chicago (Ill.) City Railway, quarterly, 2½ per cent.

Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., quarterly, 2 per cent, common.

The Citizens' Traction Company, Oil City, Pa., $1.25, preferred.

City Railway, Dayton, Ohio, quarterly, 1½ per cent, preferred; quarterly, 2 per cent, common.

Columbus, Newark & Zanesville Electric Railway, Cincinnati, Ohio, quarterly, 1½ per cent, preferred.

Consolidated Cities Light, Power & Traction Company, New York, N. Y., quarterly, three-quarters of 1 per cent.

International Traction Company, Buffalo, N. Y., 2 per cent, preferred (No. 4).

Manchester Traction, Light & Power Company, Manchester, N. H., quarterly, 2 per cent.

Monongahela Valley Traction Company, Fairmont, W. Va., 1½ per cent, common.

Montreal (Que.) Tramways, quarterly, 2½ per cent.

Nashville Railway & Light Company, Nashville, Tenn., quarterly, 1¼ per cent, preferred.

New England Investment & Security Company, Springfield, Mass., $2, preferred.

Porto Rico Railways, Ltd., quarterly, 1¾ per cent, preferred; quarterly, 1 per cent, common.

Public Service Investment Company, quarterly, $1.50, preferred; $2, common.

Springfield & Xenia Railway, Springfield, Ohio, quarterly, 1½ per cent, preferred.

United Railways & Electric Company, Baltimore, Md., quarterly, 50 cents, common.

Western New York & Pennsylvania Traction Company, Olean, N. Y., 3 per cent, first preferred.

West Penn Railways, Pittsburgh, Pa., quarterly, 1¼ per cent, preferred.

Youngstown & Ohio River Railroad, Leetonia, Ohio, quarterly, 1 per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

ATLANTIC SHORE ELECTRIC RAILWAY, SANFORD, ME.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., May, '14	$27,199	$23,563	$3,636	$650	$2,986
1 " " '13	28,927	23,655	5,272	615	4,657

BATON ROUGE (LA.) ELECTRIC COMPANY

1m., Apr., '14	$13,589	*$9,256	$4,334	$2,109	$2,225
1 " " '13	12,240	*7,416	4,824	2,083	2,741
12 " " '14	169,900	*110,503	59,397	25,259	34,138
12 " " '13	152,007	*92,477	59,530	21,817	37,713

BROCKTON & PLYMOUTH STREET RAILWAY, BROCKTON, MASS.

1m., Apr., '14	$8,338	*$8,545	$207	$1,082	†$1,289
1 " " '13	8,354	*7,413	941	1,131	†190
12 " " '14	121,655	*100,919	20,736	12,923	7,813
12 " " '13	121,248	*93,334	27,914	12,755	15,159

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.

1m., Apr., '14	$26,505	*$16,694	$9,811	$6,427	$3,384
1 " " '13	27,917	*15,858	12,059	6,082	5,977
12 " " '14	375,098	*210,677	164,421	74,560	89,861
12 " " '13	371,180	*196,699	174,482	69,553	104,929

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., May, '14	$94,761	*$59,111	$35,650	$28,840	$6,810
1 " " '13	123,316	*67,453	55,863	24,607	21,256
12 " " '14	1,172,194	*709,159	463,035	315,806	147,229
12 " " '13	1,148,956	*688,676	460,280	280,044	180,236

COLUMBUS (GA.) ELECTRIC RAILWAY

1m., Apr., '14	$55,234	*$22,660	$32,575	$24,827	$7,748
1 " " '13	54,348	*26,678	27,670	20,314	7,356
12 " " '14	643,374	*281,014	361,360	292,289	70,071
12 " " '13	638,473	*287,867	350,606	232,413	118,293

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

1m., May, '14	$254,559	*$166,580	$87,979	$47,088	$40,891

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

1m., May, '14	$227,430	*$153,711	$73,719	$54,686	$19,033
1 " " '13	222,156	*124,338	97,818	50,051	47,767
12 " " '14	2,751,609	*1,731,975	1,019,634	611,725	407,909
12 " " '13	2,553,089	*1,411,159	1,141,930	584,674	557,256

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1m., May, '14	$538,473	*$287,288	$251,185	$183,643	$67,542
1 " " '13	549,852	*269,709	280,143	162,174	117,969
12 " " '14	6,739,779	*3,353,244	3,386,535	2,103,753	1,282,782
12 " " '13	6,697,304	*3,296,138	3,401,166	1,829,287	1,571,879

REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y.

1m., May, '14	$257,020	*$150,032	$106,987	$44,446	$62,541
1 " " '13	245,342	*151,734	93,609	45,705	47,904
12 " " '14	3,078,559	*1,849,092	1,229,466	529,755	699,712
12 " " '13	2,808,243	*1,701,082	1,107,161	536,980	570,181

*Includes taxes.
†Deficit.

Traffic and Transportation

Toronto Company Replies to Traffic Recommendations

H. S. Osler appeared before the Ontario Railway Board on June 26 for the Toronto (Ont.) Railway in connection with the recommendations of C. R. Barnes, the board's traffic expert. As noted in the ELECTRIC RAILWAY JOURNAL of June 20, page 1419, Mr. Barnes recommended that the company extend the Teraulay line north from Agnes to College Street, to be completed by Nov. 1, in order that the College cars may be taken off Yonge Street. He also suggested that the Bloor line be extended from Lansdowne Avenue to High Park. Mr. Osler contended in the latter instance that the work proposed was outside the limits covered in the franchise agreement of 1891. The company agreed to rearrange the layout at Broadview and Gerrard immediately. R. J. Fleming, general manager of the company, contended that it would be impossible to lengthen the platforms and lower the steps of the 202 old double-truck cars. Chairman McIntyre of the board held that at least 164 could be so reconstructed. Mr. Fleming finally agreed to rebuild thirty-four of the cars before Aug. 15, and to report on the others thereafter. The company consented to continue its custom of the last four or five years and equip new cars with push buttons at the time they are built. The company agreed to install an adequate private telephone system and to report before Oct. 1 on the recommendation for a change in the method of heating the cars. A number of regulations to promote safety and minimize blocking of the aisles were agreed upon. All the cars will be equipped with proper illuminated route signs, front and right side, during the next ten months.

Near-Side Stop Advocated in Cleveland.—Director of Public Safety Benesch of Cleveland is advocating a change to the near-side stop by the Cleveland Railway.

Fast Freight and Express Service.—H. W. Clapp, general superintendent of the Columbus Railway, Light & Power Company, has announced the establishment of a fast freight and package service between Columbus and Westerville by the company. Cars will make two round trips a day.

Accident on Lake Shore Electric Railway.—More than thirty persons were injured, some perhaps fatally, on June 22, when an eastbound limited car on the Lake Shore Electric Railway, Cleveland, Ohio, collided with a work train standing on a siding near Sandusky. Few of the passengers escaped superficial injuries.

Tacoma Company to Restore Transfer Privileges.—The Tacoma Railway & Power Company, Tacoma, Wash., has announced that it will restore transfer privileges which were recently withdrawn, on the understanding that an ordinance will be passed by the city protecting the company against the misuse of the slips.

Monthly Accident Reports Requested.—The Illinois Public Utilities Commission has requested all electric railways and other public utilities in the State to furnish sworn statements of all accidents the first of each month. Fifty per cent of all railroad accidents in Illinois are attributed to trespassing, and the commission is anxious to take action to eliminate such accidents.

Cincinnati Suburban Company Answers Complaint.—The Interurban Railway & Terminal Company, Cincinnati, Ohio, has filed with the Public Utilities Commission a denial of the complaints made against it by City Solicitor Walter Schoenle of Cincinnati. The company says that extra trains have always been used when they were needed and that this custom will be continued. It denies that it is the only line furnishing service to the district through which it passes.

Indianapolis-Louisville Service.—Frank Smith, the vice-president of the Interstate Public Service Company, which owns and operates the lines between Louisville and Indianapolis, has discussed with John Telford, of the transportation committee of the Board of Trade of Louisville, and other members of that organization the lack of depot facilities of which the Louisville shippers complain. It is understood that the order of the Interstate Commerce Commission in regard to through rates between the cities will be obeyed soon.

Crop Prospects Near Louisville.—By improved methods of packing freight in its cars the Louisville & Interurban Railway, Louisville, Ky., has been able to take care of a largely increased freight business on its country lines without the addition of equipment. Freight business of the lines out of Louisville has increased rapidly in the last year or so. This season the prospects for tremendous crops of raspberries and blackberries are the best ever and should yield much freight for the Louisville & Interurban Railway as well as for the Insull lines across the river.

Near-Side Ordinance in New York.—The Aldermen of New York on June 30 passed the ordinance requiring surface cars to stop on the near side of streets. At present cars stop on the near side where there are intersecting car lines and at "fire stop" and "school stop" streets. The ordinance says that cars must stop at the near side of all streets "except that in unusual cases, where considerations of safety or convenience so demand, the Police Commissioner may authorize variations from the rule." In such cases "trolley stop" signs will be displayed. If the Mayor signs the ordinance it will take effect on Sept. 1.

More Double-Deck Cars in Pittsburgh.—Pittsburgh now has six double-deck street cars. Two additional cars of this type were put into service on June 20 by the Pittsburgh Railways. They are equipped with the safety device invented and patented by P. N. Jones, general manager of the company, which short-circuits the motors through resistance and insures the immediate stoppage of the car. There is no failure of the safety device even if the trolley is off the wire and the hand brakes and air-brake apparatus are disabled. The seating capacity of each car is 110.

Through Rate Hearing in Peoria.—Acting upon a complaint of the Chicago, Ottawa & Peoria Railway, Ottawa, Ill., the Interstate Commerce Commission will hold a hearing in Peoria on July 14 to determine whether or not through freight rates between electric and steam railroads shall be adopted. F. E. Fisher, general superintendent of the company, argues that the lack of interchange rates has been productive of losses to the interurban lines. He cites instances where steam roads have declined to make a through rate for merchandise originating on the electric railway.

Canadian Post-office Act Amended.—By the terms of an amendment to the Canadian post-office act passed by the House of Commons at Ottawa on May 4 and by the Senate on June 4, the postmaster-general has been empowered to fix the rate at which an electric railway operating in Canada shall carry letter carriers on the cars. As the bill passed the House the postmaster-general was authorized to fix the rate without redress on the part of the company. The Senate, however, inserted a clause making it possible for a company to appeal to the Railway Commission for redress in the event of a dispute arising.

Another Toronto Civic Line Fare Proposal.—Works Commissioner Harris, of Toronto, Ont., reported to the Board of Control on June 25 that the interchange of traffic between the Toronto Railway and the Civic Car lines would probably increase the receipts of the latter $6002 a year and reduce the annual deficit from $205,842 to $199,839. This is on a basis of 5 cents for a fare with transfer privileges and 3⅛ cents for a local fare. The Comptrollers reserved consideration. Mayor Hocken remarked that the scheme did not look financially worth while, in comparison with Comptroller O'Neill's proposal to fix a flat local fare of 2½ cents a ride.

Increase in Pay on South Carolina Road.—The following announcement was made recently by the Greenville, Spartanburg & Anderson Railway, Greenville, S. C.: "Beginning July 1 the pay of the motormen and conductors will be increased from 12½ cents an hour for the first year to 15 cents an hour and the years of service will be rewarded by increase of pay to 1 cent an hour for each year of service until 20 cents an hour is reached. The minimum day rate will be increased from $1 to $1.20. It is with pleasure that we are giving this increase and take this opportunity of expressing our appreciation of the faithful service of the motormen and conductors."

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Albany Traffic Recommendations Forwarded to Company.—The Public Service Commission of the Second District of New York has forwarded to the United Traction Company, Albany, the report of Charles R. Barnes, electric railway inspector of the commission, and has notified the company that it must file its answer to the recommendations made by Mr. Barnes on or before July 7. No action by the commission in regard to hearings on the report will be taken until after the reply of the company has been received. The recommendations contained in the report of Mr. Barnes were published in the ELECTRIC RAILWAY JOURNAL of June 27, 1914, page 1478.

Mail and Express Franchise in Salt Lake City.—The amended ordinance granting the Utah Light & Railway Company, Salt Lake City, Utah, a franchise to haul mail and express matter over its interurban lines and into the city along West Temple Street has been passed by the City Commission. The provision to allow carload freight hauling was stricken out. Perhaps the principal provision inserted in the franchise before it passed was the one prohibiting the company from operating its mail and express cars in trains. The franchise runs until 1955, when all the other Utah Light & Railway Company franchises expire. The company agrees to pay the city $25 a year for each car used in transporting mail or express.

Through Express Service Between Worcester and Providence.—Arrangements have been made for the operation of through electric railway express service between Worcester, Mass., and Providence, R. I., over the Worcester Consolidated Street Railway, the Rhode Island Company and connecting lines. The plan is to have the through cars leave Providence on Monday, Wednesday and Friday afternoons at 3.30, arriving in Worcester at about midnight. The goods will be ready for delivery at 6 o'clock the next morning. The cars for Providence will leave Worcester Tuesday, Thursday and Saturday afternoons at 4.30, and the merchandise will be ready for delivery in Providence at 7.30 in the morning. Going each way the cars will take on merchandise only at Milford.

Suspension of Schedule Order in Washington.—The Public Utilities Commission of the District of Columbia and the Interstate Commerce Commission have granted the applications of the Capital Traction Company and the Washington Railway & Electric Company for the suspension of orders relating to schedules on their lines from July 1, 1914, to Sept. 15, 1914. A written statement from each company was filed with the district commission, agreeing that, if the service provided on any line between the dates mentioned during the periods of the day covered by the suspended orders was not sufficient in the opinion of the commission, the service on that line would be increased without the necessity of a formal hearing or the issuing of an order by the commission.

Protest Against Abandonment of Service.—Citizens of Jackson County have filed with the Public Utilities Commission a protest against the suspension of operation of electric cars on what is known as the Jackson and Hamden belt line, owned by the Hocking Valley Railroad, Columbus, Ohio. The cars were operated by electricity, and a number of towns and individuals were furnished current for lighting. The line is 17 miles long. According to the company the line is unprofitable and the track will soon have to be reconstructed. The company expects to operate steam trains over the road. The complaint states that several hundred miners use the electric cars daily and that it would be impossible for them to travel to and from their work conveniently on a steam road schedule.

Service Complaint Closed.—The Public Service Commission of the Second District of New York has closed upon its records the complaint of residents of Aqueduct against Schenectady Railway as to service rendered the public, the railway company having agreed that a shop car will be put on immediately, running from Aqueduct to the General Electric Company's works in the morning and returning in the evening; that the waiting room at Aqueduct will immediately be repaired and lighted and kept in a proper condition. Certain of the cars operated between Aqueduct and Schenectady have already been overhauled, and the company further agrees to make other improvements in the character of the cars and the time schedules before October next.

New York Subway Advertising Contract.—George F. Hurd, counsel for the Auto Sales Gum & Chocolate Company, has notified the Public Service Commission for the First District that his clients will not make any offer for the newsstand and advertising privileges on the new rapid transit lines on the conditions recommended to the Public Service Commission for the First District by the Interborough Rapid Transit Company. That company has made a new contract with Artemus Ward, formerly Ward & Gow, for these privileges, and this contract is now pending before the commission for approval. The Interborough Company has also submitted to the commission certain conditions which it would impose if the privileges are put up for public bidding. The commission as yet has not taken final action on the contract.

New Transfers in St. Louis.—The United Railways, St. Louis, Mo., arranged beginning July 1 to issue transfers in accordance with the conditions mentioned in the ELECTRIC RAILWAY JOURNAL of May 9, 1914, page 1061. The new transfers are double in form. The conductor to whom the first fare is paid issues the transfer, punching crosstown lines and the line to carry the passenger to his destination. The conductor of the intersecting line takes up the original or first transfer and the conductor of the last line to be used takes up the second half or duplicate transfer. On the duplicate transfer is printed: "This transfer, issued under rules of company and decree of Circuit Court, good only at intersections punched within time and direction punched; not accepted unless properly punched; not good for round trip; not transferable to another."

Smoking Question in Louisville.—The matter of smoking on the cars of the Louisville & Interurban Railroad is before the patrons of the line and the representatives of the company. In seasons past the conductors have permitted the no-smoking rule to become inoperative so far as it applied to the open trailers which are attached to several of the early morning cars to bring the business men into town. A car that reached the city at 8 o'clock carries a trailer. Both motor and trailer are occupied mostly by men. For the last season or so the men have been permitted to finish their after breakfast cigars on the cars. Lately the no-smoke order has been enforced by the conductors. Smokers protested in vain to the conductors and at length the men selected a committee which arranged to wait on Samuel Riddle, superintendent of the company. The patrons of the train in question are asking that a few seats at the rear of the trailer be set aside for smokers as is done in the open cars on the city system. Only the cars used on the Lagrange division of the company's lines are equipped with a smoking compartment. What in other localities is the smoking compartment of trolley lines constitutes the "Jim Crow" section of the cars of the Louisville & Interurban system.

Front-End Collection System Modified.—A successful variation of the front-end collecting system has been used by the Metropolitan Street Railway at Electric Park, Kansas City's chief summer resort in the southeast section of the city. Much difficulty formerly was encountered by the company in collecting from all passengers during the rush hours at the park, as well as in handling the crowds expeditiously. Automatic turnstiles have been installed at the park exits, two conductors being stationed there. All persons leaving the park desiring to ride into the city pass through the gates, the number being automatically recorded. The men at the gates must show 5 cents for each person using the stiles. One man collects fares, while the other distributes transfers, on which only the hour is punched. Passengers then board any car they wish, entering by either the front or rear doors. As soon as the car is filled it moves on, the conductor collecting or punching the transfers held by the passengers at his leisure, and not as the passengers enter. In the past many persons riding to the park have remained on the cars, the conductors being unable to collect the return fare by reason of inability to identify the passenger. Anyone not holding a transfer received at the park exit must now pay the conductor.

Personal Mention

Mr. A. K. Bodholdt, for years one of the trial attorneys of the Chicago (Ill.) City Railway, has been appointed assistant secretary of the Central Trust Company of Illinois, Chicago.

Mr. Frank J. Duffy, president and manager of the Southern Railway & Light Company, Natchez, Miss., has been elected president of the Natchez Chamber of Commerce, the leading commercial organization of the city.

Mr. B. W. Lynch, formerly general auditor of the Consumers Power Company of Minnesota, has been appointed assistant to the general auditor of H. M. Byllesby & Company to succeed Mr. N. P. Zech, resigned.

Mr. H. T. Willett has resigned as secretary of the Springfield (Ill.) Consolidated Railway and the Springfield Gas & Electric Company on account of ill health. Mr. Willett has been with the companies for seven years.

Mr. Charles Walsh, who has been assistant to the chief auditor of Hodenpyl, Hardy & Company, New York, N. Y., has been appointed secretary of the Springfield (Ill.) Consolidated Railway and of the Springfield Gas & Electric Company.

Mr. J. H. Hickey, formerly purchasing agent of the Buffalo, Lockport & Rochester Railway, with headquarters at Rochester, N. Y., has been appointed assistant purchasing agent of the Empire United Railways, Inc., with headquarters at Syracuse, N. Y.

Mr. J. C. Stone has been appointed assistant traffic manager of the Northern Electric Railway, Sacramento, Cal., to serve under Mr. J. R. Wilson, traffic manager of the company. Mr. Stone was formerly connected with the Southern Pacific Company as district freight and passenger agent at Sacramento, and afterward was chief clerk to the general freight agent of that company located at San Francisco.

Mr. George Kuhn, who has been appointed master mechanic of the International Railway, Buffalo, N. Y., entered business with the Buffalo Street Railroad in 1883. He was subsequently appointed to take charge of the wood-working department and later was placed in charge of the truck and motor department. Since then he has served in turn as carhouse foreman, general foreman in the shops and carhouses and assistant master mechanic.

Mr. W. H. Sawyer has resigned as engineer in charge of the New York office of Ford, Bacon & Davis, New York, N. Y., to become connected with the E. W. Clark & Company Management Corporation as vice-president, with headquarters at Columbus, Ohio. Mr. Sawyer was born forty years ago at Schoolcraft, Mich., and was graduated from the University of Nebraska in 1894 with the degree of B.S. For two years after graduation he was with several street railway companies. Subsequently he entered the employ of the railway and engineering departments of the General Electric Company, with which he continued for nine years. He next entered the employ of Ford, Bacon & Davis, with whom he has been connected for nine years. On June 26 Mr. Sawyer was tendered a farewell dinner at the Railroad Club of New York by the members of the Deportation Club. Mr. Sawyer was one of the charter members of this society and took an active part in its functions. Mr. Frank Hedley, vice-president of the Interborough Rapid Transit Company, acted as toastmaster at the affair on June 26 and in behalf of those in attendance presented Mr. Sawyer with a large silver loving cup.

W. H. Sawyer

Mr. W. L. Davis, formerly assistant secretary and assistant treasurer of the Texas Power & Light Company and affiliated companies, was recently appointed superintendent of accounts of the Strickland-Goodwin Management Association, of Dallas, Tex., succeeding Mr. J. R. Wolfe, assigned to other duties.

Mr. R. F. Kelker, Jr., has been appointed traction expert in charge of the traction bureau of Chicago's department of public service. Mr. Kelker resigned his position as assistant to the district engineer of the Central District, Division of Valuation, Interstate Commerce Commission, Chicago, to take up his new work. Prior to accepting the Government position he was principal assistant engineer to Mr. George Weston, engineer of the Board of Supervising Engineers, Chicago Traction.

Mr. J. R. Wilson, who has been appointed traffic manager of the Northern Electric Railway, Sacramento, Cal., began his railway career in the local freight office of the Southern Pacific Company at El Paso, Tex., twelve years ago. After serving for a year at El Paso he was transferred to the general freight office of the Southern Pacific Company at San Francisco where he was employed for two years. He resigned from the Southern Pacific Company to become connected with the San Francisco agency of the Illinois Central Railroad as traveling freight and passenger agent in the San Joaquin and the Sacramento Valleys. Three years ago he was appointed commercial agent of the Illinois Central Railroad at San Francisco, in which capacity he continued until his recent appointment as traffic manager of the Northern Electric Railway. Mr. Wilson succeeds Mr. S. W. Russell with the Northern Electric Railway.

OBITUARY

Herman Porter Kimball, who for nearly twelve years was associated with the New York office of the Standard Underground Cable Company, Pittsburgh, Pa., died on June 24 at New Rochelle, N. Y. He was forty-eight years old. Mr. Kimball was born in Fitchburg, Mass. For six years prior to his connection with the Standard Underground Cable Company he was engaged in electrical engineering.

Redick M. Ridgely, superintendent of the Springfield (Ill.) Consolidated Railway from 1876 to 1899, died at his home in that city June 23, at the age of eighty-four years. Mr. Ridgely had resided in Springfield since a boy and had been prominent in business and politics there for a half-century. He was postmaster at one time and a member of the State Legislature.

New Plan to Control Railroad Securities

On June 26 Louis D. Brandeis, Boston, and George Rublee, New York, laid before the Senate interstate commerce committee a new suggestion for the control of railroad security issues. The suggestion is proposed in place of portions of the House railroad capitalization bill now before the Senate committee and provides in brief that after Jan. 1 next no common carrier will be allowed to acquire any interest in any property or be permitted to issue any securities or assume any obligations except for purposes of construction, improvement or betterment of facilities of its railroad or "some railroad, boat line or car line" which it lawfully owns or operates; or for refunding lawfully issued securities, or for the reimbursement of the treasury of the company for any lawful expenditures, or for the acquisition of any transportation line authorized by the Interstate Commerce Commission or for some purpose approved by the commission where the expenditure involved "will not impair the capacity of the carrier to perform its public duty." Another feature provides that no carrier shall be allowed after the passage of the act to acquire, lease or purchase any interest in the railroad, boat line or electric railway unless authorized by the commission after a hearing.

On June 30, H. P. Thom, general counsel for the Southern Railway, offered an amendment to the House bill creating a bureau of credits and securities under the commission to be appointed for six years to examine and determine questions of security issues. A report of this bureau in such cases would become the order of the commission five days after made unless the commission ordered a hearing.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

*North & South Railway, Wichita, Kan.—Incorporated in Kansas to build an electric railway between Wichita, Concordia and Washington, Kan., a distance of about 200 miles.

*Ephrata & Lebanon Street Railway, Lebanon, Pa.—Chartered in Pennsylvania to build an electric railway between Lebanon and Ephrata. This company is separate from the other companies chartered to build lines in this section. Capital stock, $34,000. Incorporators: C. O. Collett, C. D. Siegle, Charles D. Lawrence, Henry O. Evans and E. T. Noble.

*Philippi & Clarksburg Traction Company, Philippi, W. Va.—Incorporated in West Virginia to build an electric railway from Philippi to Clarksburg. Capital stock, $25,000. Incorporators: Samuel V. Woods, J. H. Woods, R. E. Talbott, Henry H. Byrer, J. C. Watson and E. R. Dyer, all of Philippi, W. Va.

FRANCHISES

*Springfield, Ill.—The Illinois Public Utilities Commission has issued a certificate of convenience and necessity to the Murphysboro & Southern Illinois Railway, which plans to build a 7-mile electric railway from Murphysboro to Carbondale. A. B. Minton, Murphysboro, is interested.

Cedar Rapids, Ia.—The Iowa Railway & Light Company has received a twenty-five-year franchise from the Council to extend some of its lines in Cedar Rapids.

Alexandria, La.—The Alexandria Electric Railways has asked the Council for a franchise to extend some of its lines in Alexandria to the city limits.

Kansas City, Mo.—An ordinance ordering the rerouting of the Minnesota-Indiana line of the Metropolitan Street Railway, Kansas City, has been passed by the City Council. The measure requires that the cars traverse Eighteenth Street as far west as Prospect Avenue north to Fifteenth and west to Main.

Portland, Ore.—Because it has been found that a portion of East Twenty-ninth Street on the course of the proposed crosstown street car line on the east side is not dedicated as a street, the Portland Railway, Light & Power Company has refused to accept the crosstown franchise granted two months ago by the City Council. The company through President Griffith will now ask for a new franchise for the crosstown line over East Thirtieth Street to Hawthorne Avenue, eliminating East Twenty-ninth Street from the route.

Providence, R. I.—The Rhode Island Company has received a franchise on Mount Pleasant Avenue, from Chalkstone Avenue to Atwell's Avenue in Providence.

Nashville, Tenn.—The Nashville Traction Company has asked the Council for a franchise in Nashville. W. O. Palmer, Nashville, president. [E. R. J., May 9, '14.]

East Dallas, Tex.—Daniel Sonnentheil and associates have asked the Council for a fifty-year franchise to build an electric line in East Dallas, to cross Lakewood addition. Several months ago another franchise was asked, but was withdrawn, the petitioners deciding that another route would be best. This proposed line will extend over Tremont, Ridgeway, Worth and Paulus streets to Junius and the Greenville road through the Belmont addition to the line of the Texas Traction Company.

Galveston, Tex.—The Galveston Electric Company has asked the Council for a franchise to extend the Avenue H line to the boulevard and to build several other short extensions in Galveston.

Port Arthur, Tex.—The Pier Railway has asked the Council for a franchise to build an electric line from the center of the city to the pleasure piers in Port Arthur. K. M. Smith, Port Arthur, is interested. [E. R. J., June 20, '14.]

TRACK AND ROADWAY

Lethbridge (Alta.) Municipal Tramway.—A by-law is being advertised at Lethbridge which includes a clause to provide $13,153 for municipal electric railway extensions in Lethbridge.

*Benicia, Cal.—Surveys have been completed and construction will soon be begun on the proposed electric line between Vallejo and Benicia. This line will enter Vallejo near the North Vallejo depot and will have its terminus at the Monticello Steamship Company. This line will be extended north from Benicia and it is believed that it is to be a part of some other railway system, possibly the Oakland, Antioch & Eastern Railroad. J. R. Cunnyngham, Benicia, is interested.

Point Loma Railroad, San Diego, Cal.—Within the next few weeks this company plans to begin work on the extension of the Ocean Beach and Point Loma line to the wireless station and to the government line at La Playa.

San Francisco (Cal.) Municipal Railway.—Work has been begun by F. Rolandi on the construction of this municipal line on Stockton Street in San Francisco.

St. Petersburg & Gulf Railway, St. Petersburg, Fla.—Two loop extensions will be built at once by this company in St. Petersburg. Contracts have been awarded by this company to build extensions of its tracks to connect its North Ninth Street line and the Coffee Pot loop line in St. Petersburg.

Washington & Lincolnton Railroad, Lincolnton, Ga.—Surveys have been completed and arrangements are being made to begin grading at once on this 25-mile line to connect Washington and Lincolnton. The following officers have been elected: J. R. Dyson, president; H. W. Quin, secretary; E. A. Barnett, M. P. Pope and M. A. Pharr, directors. [E. R. J., June 6, '14.]

*Murphysboro & Southern Illinois Railway, Murphysboro, Ill.—Right-of-way is being obtained by this company for its 7-mile electric line between Murphysboro and Carbondale. Among those interested are: A. B. Minton, Murphysboro; Charles H. Clay and Edward Flad.

La Salle County Electric Railroad, Ottawa, Ill.—Surveys have been completed between Ottawa and Mendota, 28 miles, grading has been completed between Ottawa and Prairie Center, 14 miles, and grading is now in progress from Prairie Center to Mendota, 14 miles. This 28-mile line will connect Ottawa, Prairie Center, Triumph and Mendota. [E. R. J., June 20, '14.]

Fort Wayne & Northwestern Railroad, Fort Wayne, Ind.—This company is asked to consider plans to build a 5-mile extension from Kendallville to Rome City.

Marion & Bluffton Traction Company, Indianapolis, Ind.—This company, formerly the Marion, Bluffton & Eastern Traction Company, has been recently organized and has elected the following officers: James W. Sale, president; Abram Simmons, vice-president; Dell Locke, treasurer, and W. A. Patton, secretary and general manager. [E. R. J., June 13, '14.]

Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia.—The extension south to Center Point has been placed in operation by this company. The extension from Center Point to Cedar Rapids will be completed before the end of the year.

Independence, Neodesha & Topeka Traction Company, Independence, Kan.—Petitions are being circulated at Neodesha, Kan., calling for an early election to vote bonds to the extent of $10,000 to this company, which proposes to build an electric line from Neodesha to Independence. T. J. Booth, president. [E. R. J., April 18, '14.]

Joplin & Pittsburg Railway, Pittsburg, Kan.—This company contemplates extending its tracks in Joplin, Mo. Business men of the city have offered a bonus for extensions to Parkview and to Fairview cemetery. Universal transfers also are proposed in order to give access to Schifferdecker Park. William A. Satterlee, Pittsburg, Kan., general manager.

Topeka (Kan.) Railway.—This company has placed in operation its line to Gage Park.

Fort Fairfield, Maine.—At a recent meeting of the Board of Trade of Fort Fairfield plans were considered to build an electric railway in Fort Fairfield and extend it to Limestone, Caribou, Caswell and other points. Eben S. Hopkins, Fort Fairfield, is interested. [E. R. J., June 13, '14.]

United Railways & Electric Company, Baltimore, Md.—This company has been ordered by the Public Service Commission of the State of Maryland to extend its Belair road line from Overlea, its present terminus, to Neckar, a distance of 3 miles.

Worcester (Mass.) Consolidated Street Railway.—This company is asked to consider plans to build a 1-mile extension from June Street and Chandler Street to Park Avenue and Chandler Street in Worcester.

Hattiesburg (Miss.) Traction Company.—This company is asked to extend its lines to the Woman's College in Hattiesburg.

***Brookfield, Mo.**—Plans are being considered to build an electric railway to connect Brookfield, Marceline, Wien, Bynumville, Prairie Hill, Clifton Hill, Randolph Springs, Huntsville and Moberly. No names are yet given of those interested in the project.

***Columbia, Mo.**—F. S. Mordaunt, Chicago, W. J. Delaney, Frank Kidd and J. N. Trescott, St. Louis, contemplate building an electric railway in Columbia and extend it to an amusement park which they propose to build.

Stone Harbor (N. J.) Terminal Railroad.—This company has completed the electrification of its line between Cape May Court House and Stone Harbor. The new central power plant of the Electric Light & Power Company at Cape May Court House furnishes power for the Stone Harbor Terminal Railroad. Plans are being discussed for an electric line to run the entire length of Seven-Mile Beach, crossing Hereford Inlet by bridge and connecting with the Wildwood electric line at Anglesea.

Schenectady (N. Y.) Railway.—Plans are being prepared by this company for extensions to the Grand Boulevard section, Carman and South Schenectady. Applications will soon be made to the Council for franchises.

Wilmington-Carolina Beach Railway, Wilmington, N. C.—Plans are being formulated by this company to build a 15-mile electric line to connect Wilmington, Carolina and Wilmington beaches. George F. Meares, Wilmington, is interested. [E. R. J., April 12, '13.]

Cleveland & Youngstown Railway, Columbus, Ohio.—Work has been begun on the line which is to extend from the downtown section of Cleveland through Kingsbury Run Valley to Shaker Lakes.

***Windsor, Ont.**—On June 9 the City Council of Windsor voted to ask the Ontario Hydro-Electric Commission to report on cost of construction, equipment and operation of electric railways to begin at a point in Sandwich West, and connect by one or more routes Sandwich, Windsor, Walkerville, Ford City, Sandwich East, and Maidstone, and villages of St. Claire and Belle River.

***Dallas, Tex.**—J. R. Babcock, secretary of the Chamber of Commerce, Dallas, A. M. Matson and J. A. Kemp, Wichita Falls, are considering plans to build an electric railway from Dallas to Wichita Falls, via Denton, about 125 miles.

Uniontown (Pa.) Radial Street Railway.—This company, which plans to build an electric line between Uniontown and Connellsville, via Oliver, has completed the section of the line between Connellsville and Oliver and will begin work on the line between Oliver and Uniontown at once. The contract for the construction of this section of the line was awarded to Reagan, Lynch & Company. Work will also be begun at once to build a new bridge over Redstone Creek in Uniontown.

Ogden, Logan & Idaho Railroad, Ogden, Utah.—This company, which is an amalgamation of the Ogden Rapid Transit Company and the Logan Rapid Transit Company, plans to begin work as soon as the right-of-way has been obtained by the Ogden Rapid Transit Company on the section of the line in Cache Valley. This will be the final link in the electric line to connect Ogden with Preston, Idaho, via Brigham, Wellsville, Logan and Lewiston.

Corpus Christi Street & Interurban Railway, Corpus Christi, Tex.—Improvements of this company's lines in Corpus Christi are being contemplated.

Portland Railway, Light & Power Company, Portland, Ore.—Material has been ordered and work will be begun at once by this company on the extension through Taylor's Astoria. As soon as this line is completed an extension to Alderbrook will be built.

Tarrant County Traction Company, Fort Worth, Tex.—The Hillsboro Chamber of Commerce has made a tentative proposition to this company to build an electric railway through Hillsboro, offering it a right-of-way and a bonus.

Houston (Tex.) Electric Company.—The bridge across White Oak Bayou has been completed and track laying has nearly been finished on this company's extension through Sunset Heights, northwest of Houston. It is planned to have this line in operation within the next few weeks.

Southwestern Traction Company, Temple, Tex.—Extensive improvements are under way to the tracks and crossings of this railway within the city limits of Temple.

SHOPS AND BUILDINGS

Union Traction Company of Indiana, Anderson, Ind.—Officials of this company spent several days in Marion recently and inspected the sites offered to them as locations for the new terminal station for this company. The city hall and several other sites were considered, the representatives of the company favoring the city hall site above all. This will be available only in case the city vacates this building for the City Market House. Definite action is expected soon.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—This company has opened its new offices at Sixth Street and Francis Street in St. Joseph.

Northern Ohio Traction & Light Company, Akron, Ohio.—A lease on a building about one block from the public square in Canton has been obtained by this company and this will be converted into a terminal station. Alterations will entail a cost of about $20,000 and a like amount will be required to lay tracks for the approach. It will be ready for use about Sept. 1. The Stark Electric Railway Company may use the same station. The change is being made to relieve congestion in the central part of Canton.

Pittsburgh (Pa.) Railways.—A new structure is to be added to the group of buildings known as the Craft Avenue carhouses of this company in Pittsburgh. The structure will be 32 ft. x 65 ft. and of brick, stone and steel construction. Its appearance will be similar to the present office and substation building on this property.

POWER HOUSES AND SUBSTATIONS

Pacific Gas & Electric Company, San Francisco, Cal.—An order has been placed by this company for one 1000-kw, 650-volt, six-phase, sixty-cycle, 600 r.p.m. rotary converter. The apparatus was ordered from the Westinghouse Electric & Manufacturing Company.

Centerville Light & Traction Company, Centerville, Ia.—This company has placed a contract for one 300-kw, 600-volt, three-phase, sixty-cycle, 1200 r.p.m. rotary converter; one 200-kw, 600-volt, three-phase, sixty-cycle, 1200 r.p.m. rotary converter. This apparatus has been ordered from the Westinghouse Electric & Manufacturing Company.

Atlantic Shore Electric Railway, Sanford, Maine.—An order has been placed by this company with the Westinghouse Electric & Manufacturing Company for one 300-kw, 600-volt, three-phase, sixty-cycle, 1200 r.p.m. rotary converter.

Benton Harbor & St. Joe Railway & Light Company, Benton Harbor, Mich.—A contract has been placed by this company for one 300-kw, 600-volt, d.c., three-phase, sixty-cycle, 1200 r.p.m. rotary converter. This apparatus was ordered from the Westinghouse Electric & Manufacturing Company.

Public Service Corporation, Newark, N. J.—Arrangements are under way by the Public Service Electric Company for the construction of a power house at Point-no-Point on the Passaic River to be used for the development of 200,000-hp to supply Essex County. The cost of the plant is to be about $2,000,000.

Hershey (Pa.) Traction Company.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for one 300-kw, 600-volt, three-phase, sixty-cycle, 1200 r.p.m. rotary converter.

Manufactures and Supplies

ROLLING STOCK

Springfield (Mass.) Street Railway is contemplating the purchase of about ten city passenger cars.

Sao Paulo (Brazil) Tramways has ordered three closed cars from The J. G. Brill Company.

Worcester (Mass.) Consolidated Street Railway is contemplating the purchase of about ten city passenger cars.

Chicago (Ill.) Surface Lines announce that bids will be received until July 8 on 228 semi-steel, double-end motor cars.

Rockland, Thomaston & Camden Street Railway, Rockland, Me., expects to purchase one double-truck snow plow, with body for mail, baggage and freight.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., has ordered ten 51 ft. 2 in., all-steel, interurban, arched-roof passenger cars from the Cincinnati Car Company through W. R. Kerschner, its Eastern representative.

Steubenville & East Liverpool Railway & Light Company, East Liverpool, Ohio, has ordered four double-truck cars from the G. C. Kuhlman Car Company. The cars will be equipped with Baldwin trucks and General Electric motors and air equipment.

Southern Traction Company, Dallas, Tex., has ordered twelve city car bodies and truck equipment from the St. Louis Car Company. The order for the electrical equipment for these cars has been placed with the Southwest General Electric Company. This company has also ordered GE electrical equipment to convert four of its city trail cars to motor cars.

Albany Southern Railroad, Albany, N. Y., is giving several of its interurban cars a general overhauling. The company is removing the varnish and replacing the old with new woodwork and is placing sheet steel on the sides and new roof which makes the cars practically steel cars. It is proposed to continue this practice until all of the cars are changed in this way.

Sacramento Electric, Gas & Railway Company, Sacramento, Cal., has ordered six 41-ft. city passenger cars of the California type from the St. Louis Car Company, through its Pacific Coast agents, Pierson, Roeding & Company, San Francisco, Cal. The cars are to be delivered early in September. With the order is an option on four more cars of the same style which are very similar to the cars which are now in service in Stockton and Fresno. The new cars will have seating capacity for forty-four passengers. They will be mounted on Brill 75-E trucks with a GE-No. 203 motor on each truck. The car bodies will have semi-steel bottom frame, flush platforms, monitor deck roof and ash interior finish. Rattan cross-seats will be installed in the closed section and wood slat seats of the Brill "Winner" type in the open sections.

TRADE NOTES

Hart & Hegeman Manufacturing Company, Hartford, Conn., has been appointed exclusive selling agent for the H. T. Paiste Company, Philadelphia, Pa.

The J. G. Brill Company, Philadelphia, Pa., at a recent meeting of its board of directors, appointed W. H. Heulings, Jr., as vice-president, J. W. Rawle as second vice-president and E. P. Rawle as treasurer.

Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., has organized a bronze department for the manufacturing of titanium bronze specialties under its various patents and has appointed Wm. M. Corse as manager of this department. Mr. Corse was formerly works manager of the Lumen Bearing Company, Buffalo, N. Y., and recently general manager of the Empire Smelting Company.

American Mason Safety Tread Company, New York, N. Y., has received an order from the Boston Transit Commission to equip with safety treads the new subway stations of the Boston Elevated Railway. An initial order for about 2000 sq. ft. of safety tread for equipping the Massachusetts and Copley stations has already been placed. Since Jan. 1 this company has furnished somewhat over 10,000 sq. ft. of safety tread to the Interborough Rapid Transit Company for the stairs and platforms of its subway and elevated stations.

I. Brooks Clarke, formerly superintendent of the New York & Long Island Traction Company, has opened an office at 431 Fifth Avenue, New York, as "safety engineer" for electric traction properties. Mr. Clarke has specialized in this and other closely allied lines of electric railway engineering since he was graduated from Cornell in 1900 and is prepared to advise electric railway companies in regard to the possibilities of reduction of accidents through the proper instruction of trainmen, in the reduction of power consumption in car operation, as well as in the reduction of troubles with train control and with straight and automatic braking for multiple unit operation. If desired, he is prepared to take charge of putting into operation plans of this kind as well as systems for the instruction of employees in efficiency in single car operation or train operation. His experience well fits him for work of this kind. For seven years he was engaged in this work for the Brooklyn Rapid Transit Company, and for the last three years of this time he had the title of assistant superintendent of the elevated lines. For a year he undertook the same work for the Public Service Railway of New Jersey. He was also for three years with the Westinghouse Air Brake Company and for six years in the shops of the Georgia Railway & Electric Company, Atlanta, Ga.

ADVERTISING LITERATURE

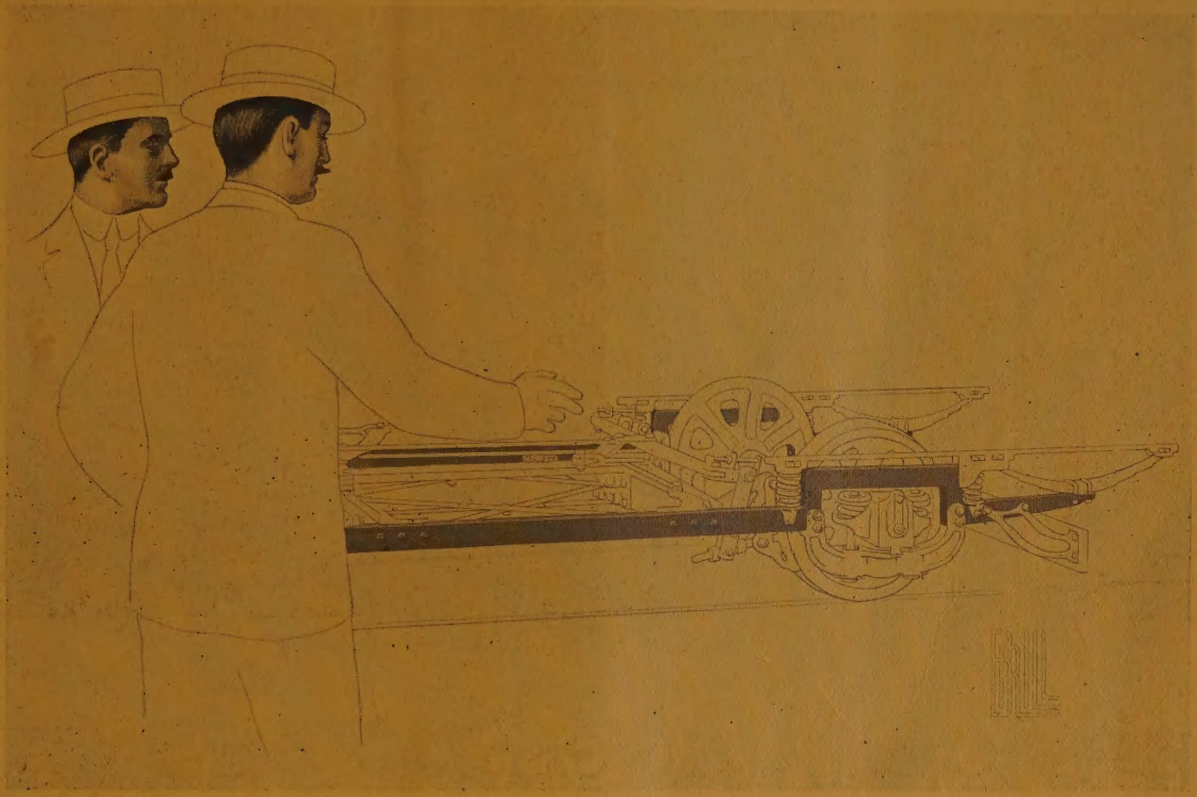
J. G. White Management Corporation, New York, N. Y., has issued an attractively printed booklet entitled "The Management of Public Service." The booklet presents a clear and concise discussion of the proper management of public service companies by showing how this ideal may be approached through observance of the following principles: (1) security of investment, due to harmonious working relations with the municipal officials in the community served and the support of public opinion; (2) wise development along systematic and conservative lines of the communities served and the properties serving them; (3) protection from competition by satisfactory quality of service; (4) economical and efficient operation by specialists who keep in touch with unit costs of operation and who are able to give clients the benefits of experience obtained on other properties; (5) proper maintenance and renewal of physical property; (6) establishment of a clear and comprehensive accounting system; (7) assisting clients in the general financing of their properties and marketing of their securities; (8) proper and thorough engineering and construction at reasonable cost; (9) a central and efficient purchasing department, which by large volume and wide range of purchases may be in a position to insure extremely low prices; (10) confidential and loyal relations with clients.

NEW PUBLICATION

Proceedings of National Association of Railway Commissioners. 612 pages. Law Reporting Company, New York, N. Y. Black Cloth, $1.

This volume is a complete report of the proceedings of the National Association of Railway Commissioners at the twenty-fifth annual convention held at Washington, D. C., Oct. 28-31, 1913. The chief value of the book to the electric railway industry lies in the fact that it contains the complete committee reports and papers before the convention on such subjects as the relation of service to rate making, accounting side of rate making, statistics and accounts of electric railways, depreciation and its relation to the fair value, elements of appreciation in valuation, railway capitalization laws, valuation decisions, relation between valuation and rate of return and the like. Abstracts of the most important of these reports and papers were published in the issues of the ELECTRIC RAILWAY JOURNAL of Nov. 1 and Nov. 8, 1913. Since the regulative powers of the commissioners who are members of this national association have been extended in many States to cover public utilities other than steam roads, the proceedings of the national body are becoming of increasing importance to the general public utility field.

BRILL RADIAX TRUCK



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For Texas, Oklahoma and Arizona business refer to Southwest General Electric Company (formerly Hobson Electric Co.), Dallas, El Paso, Houston and Oklahoma City. For Canadian business refer to Canadian General Electric Company, Ltd., Toronto, Ont. 5055